NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 51 DECEMBER 21, 1987

▶ *RBHC TARIFFS*

ICA takes FCC to court

Petitions for aid in special access pricing dispute.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The International Communications Association (ICA) last week filed a petition with the U.S. Court of Appeals to force the FCC to rule on the legality of RBHC special access tariffs.

ICA attorney Brian Moir said the user association took legal action because the Federal Communications Commission had failed to resolve the special access pricing issue, despite two years of investigation. The FCC launched its "Investigation of Special Access Tariffs of Local Exchange Carriers" in March 1985.

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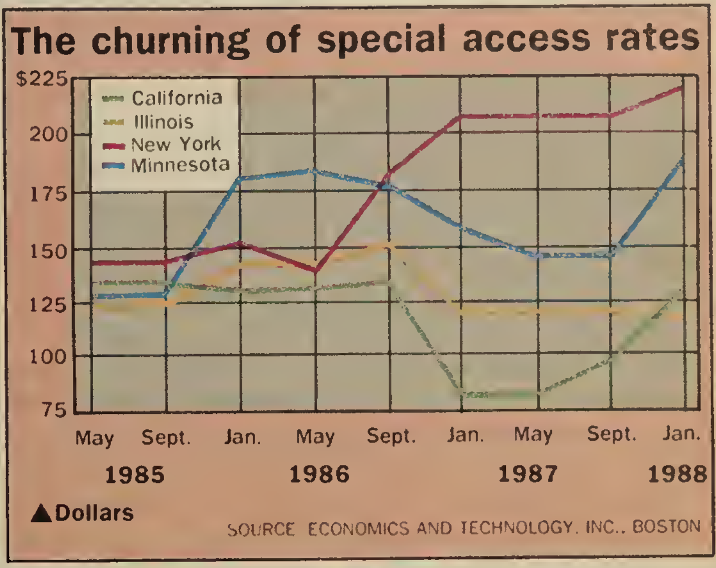

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FEATURE FOCUS

Wichita public school district wins User Excellence Award

Microwave voice/data net links 110 buildings.

BY JULIA KING
Special to Network World

Integrating voice and data on T-1 links is usually the province of large corporations. But the project begun in 1985 by Unified School District 259 of Wichita, Kan., proved just as demanding as any major corporate network installation.

The district's new microwave T-1 and twisted-pair network, linking 110 schools and administration buildings, is projected to save more than half a million dollars in its first year of operation. This successful and ambitious project has earned District 259 *Network World's* Third Annual User Excellence Award.

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▶ *T-1 NETWORKS*

Ford picks AT&T for custom net

BY BOB WALLACE
Senior Editor

DEARBORN, Mich. — Ford Motor Co. has awarded AT&T a lucrative contract for construction of a custom-designed, nationwide T-1 network, sources told *Network World* last week.

The contract, which is still being finalized, is the latest step in AT&T's ongoing effort to provide its largest customers with custom networks using a blend of AT&T's transmission and network management services.

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NEWSPAPER

▶ *PBX/COMPUTER INTEGRATION*

IBM mini to support voice

BY PAUL KORZENIOWSKI
Senior Editor

IBM plans to repackage its Redwood private branch exchange so it can be housed in the chassis of a new mid-range computer expected to be announced next year, *Network World* has learned.

Redwood is a low-end digital PBX that supports 16 to 144 lines. Analysts said engineers in IBM's PBX division are working to reduce Redwood's circuitry so it will fit on two expansion boards that could be installed within a departmental system. That system, code-named Silverlake, is currently under development. Installation of the PBX components reportedly would be an option for Silverlake users.

Silverlake, which has been talked about by analysts and IBM for more than a year, will combine the features of the IBM

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▶ *YULETIDE YEARNINGS*

Dear Santa: Please bring network gifts

Managers draw up their Christmas wish lists.

BY MICHAEL FAHEY
Senior Writer

Visions of shiny new network management tools and straight-talking vendors are dancing in the heads of communications managers this Yule season.

A steady supply of trained personnel and an end to incompatibility woes are also among the gifts managers are hoping Santa will bring them this Christmas.

Keith Nichols, manager of corporate telecommunications for Wickes Co. in Santa Monica, Calif., said his holiday wish is that Santa will give the International Standards Organization (ISO) some help in delivering the Open Systems Interconnect

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▶ *ALLIANCES*

Vodavi buys Executone, merges with ISOETEC

BY PAM POWERS
Senior Editor

SCOTTSDALE, Ariz. — Vodavi Technology Corp. last week scooped up Contel Corp.'s unprofitable Executone unit and said it will merge with key system maker ISOETEC Communications, Inc.

Vodavi, a vendor and distributor of key and hybrid systems, cited increased efficiency as the primary reason for aligning with the two other phone system manufacturers. Analysts said the moves are in keeping with industry consolidation and would give Vodavi the strength it needs to compete in a market plagued by sluggish growth and stiff competition.

Vodavi plans to merge with Darien, Conn.-based ISOETEC and combine its operations with Executone, which it bought for $60 million. Contel has had Executone, which lost more than $8 million in the first nine months of 1987, on the auction block since early this year. Both transactions are subject to regulatory approval.

Vodavi equipment, manufactured by an equity investor in South Korea, is sold directly to end users as well as distributed through third parties such as Executone, Siemens AG's Tel Plus Communications, Inc. operation and GTE Corp. Vodavi's phone systems business contributes about 75% of the company's revenue, which will total roughly $100 million in 1987. The firm also has subsidiaries that market network equipment to the Bell operating companies, and it has a 50%-50% joint venture with Pacific Telesis Group in the consumer telephone market.

Executone distributes Vodavi equipment in addition to private branch exchanges built by Northern Telecom, Inc. and SRX, Inc. The company sells through 85 independent distributors and 22 company-owned dealerships.

Executone was put up for sale as part of Contel President and Chief Executive Officer Donald E. Weber's plan to dispose of unprofitable businesses. "Executone is not making money and doesn't fit into Weber's plan for the future of Contel," a Contel spokesman said. Contel owns several hundred independent telephone companies and a number of nonregulated communications businesses.

Where Executone has failed, ISOETEC has turned a profit. For the nine months ended Sept. 30, ISOETEC reported earnings of $4.7 million on revenue of $75.2 million. It targets the low end of the telephone systems market with key systems and hybrid systems that are manufactured in South Korea and sold through a direct sales force and a string of distributors.

Vodavi Chairman Steven Sherman said he is confident the combined operations will be highly successful. "We expect to be a leader in this business," he said, adding that combined operations would generate about $400 million in 1988.

Sherman said Executone will continue to sell other manufacturers' equipment. Vodavi will, however, consolidate the operations of Executone and ISOETEC to create greater efficiency, he said.

Sherman cited continued consolidation in the phone system market as one major catalyst for this week's moves. Among other recent deals, Siemens bought Tel-Plus, and TIE/communications, Inc. bought Honeywell, Inc.'s phone systems business.

▶ *PEER-TO-PEER COMMUNICATIONS*

Users weigh IBM, third-party LU 6.2 schemes

BY PAULA MUSICH
Senior Editor

Users and consultants evaluating IBM and third-party methods of implementing IBM's LU 6.2 protocol on personal computers are at odds over which approach is best.

With IBM's Advanced Program-to-Program Communications/Personal Computer approach, the protocols are processed by the Personal Computer's microprocessor. But several third-party vendors are about to release intelligent communications adapters that off-load protocol processing to a coprocessor. While use of the new third-party products can improve performance and relieve memory overhead in the personal computer, questions remain about compatibility and support.

IBM's APPC/PC program hogs memory and cripples use of LU 6.2 applications, users say. "The APPC/PC program takes between 150K to 220K bytes of memory and runs as a part of your application program," said Dick Boyle, assistant director of software development for The Travelers Corp. "While communications takes place between the personal computer and the host, your application is disabled." By off-loading communications processing to a coprocessor on the adapter, which could be a Synchronous Data Link Control, X.25 or IBM Token-Ring Network card, both programs can run at the same time.

This approach, which Montreal-based Eicon Technology Corp., Laguna Hills, Calif.-based Network Software Associates, Inc. (NSA) and others are working on, provides both memory and performance advantages, according to Steve Randesi, chairman of the consulting firm Gen2 Ventures in Saratoga, Calif. The performance differences can be quite dramatic, according to Deborah Walters, a communications software consultant who supervised a series of tests for each approach.

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▶ *MODIFIED FINAL JUDGMENT*

MFJ may lose Greene

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Officials in the Reagan administration last week debated whether to propose legislation that would preempt U.S. District Court Judge Harold Greene's authority over the telecommunications industry.

The legislation, under consideration by the White House Economic Policy Council (EPC), would remove control of the Modified Final Judgment from Greene and likely open the door for the regional Bell holding companies to engage in currently restricted businesses. The EPC, which includes President Reagan's top cabinet advisors, has been meeting with representatives of the RBHCs and government officials involved in telecommunications policy.

Even if the Reagan administration decides to endorse legislation, the U.S. Congress is unlikely to pass such a measure unless it has widespread industry support, according to observers.

The National Telecommunications and Information Administration (NTIA), a division of the U.S. Department of Commerce, has spearheaded the administration's effort to lift the RBHC limitations. These business restrictions keep

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DSP Technologies introduces a teleconferencing bridge that allows up to 15 people to participate in a teleconference call. **Page 21.**

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Network World wants to make its news coverage even better, and for that we ask your help. If you know of an interesting event that just occurred or is about to occur, please call. We'd also like to know how you optimize your networks. Call Editor Bruce Hoard toll free at (800) 343-6474.

Correction: The story "Appleby takes TCA reins," (*NW*, Dec. 14), incorrectly stated that the Tele-Communications Association will move its annual convention to another site after 1988. The conference will be relocated after the 1989 meeting.

TIMEPLEX/UNISYS:

RESHAPING THE FUTURE OF COMMUNICATIONS NETWORKING

On November 9, Timeplex and Unisys announced an agreement whereby Unisys plans to acquire Timeplex. As a result, some things will change. Many things **WILL NOT CHANGE.**

- Systems Connectivity Architecture, our corporate philosophy, **WILL NOT CHANGE.** SCA describes our commitment to provide open systems connectivity and support to meet the current and changing needs of our customers' networks.
- Designing integrated systems solutions for integrated network management and control **WILL NOT CHANGE.** Multi-vendor systems are a reality and connectivity is key.
- Supporting current and evolving standards through: open interfaces to TIME/VIEW, our integrated network management system; on-going support of IBM's NetView; participation in standards bodies, and the pursuit of standards such as OSI with other vendors **WILL NOT CHANGE.**
- Developing innovative technology that expands our customers' existing systems by providing a smooth migration path while protecting their present investment **WILL NOT CHANGE.**
- Our Timeplex name, our organization and the Timeplex team that has served our customers for over 18 years **WILL NOT CHANGE.**

WHAT WILL CHANGE, is that we now will enjoy the backing of Unisys, a $10 billion information systems company. This will help us to enhance our market leadership position, and our ability to deliver business communications solutions.

The foundation of our success has been our relationship with our customers. More than ever, Timeplex will remain their communications partner—solving their voice/data networking problems—today and in the future.

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▶ *GREMLINS*

Ghost in the machine slows IBM's E-mail

BY JOSH GONZE
Senior Writer

ARMONK, N.Y. — A ghost invaded IBM's internal electronic-mail network recently, slowing message traffic as it delivered holiday greetings to the company's employees.

A file carrying an innocuous Christmas message and a display of a Christmas tree was transmitted to end users over the E-mail network, which is based on the company's IBM Professional Office Systems software.

A program within the file searched the recipients' directories to find distribution lists used to forward copies of a message automatically to groups of people. An IBM spokesman said copies of the Christmas file were then forwarded to each person on the distribution list.

As copies of the file reached the next person's workstation, the process repeated itself, sending more files around the network.

The file's proliferation created so much traffic on the network that delivery of E-mail was noticeably slowed, although company and user files were not damaged, the spokesman said. However, the file did enter the networks of other companies with links to IBM's network.

> The file's proliferation created so much traffic on the network that delivery of E-mail was noticeably slowed, although company files were not damaged.

In true Christmas spirit, IBM is sharing with those companies its solution to the ghost file. That solution involves alerting employees to the file and providing them with instructions on how to prevent it from proliferating, the spokesman said.

The mysterious file may have had its origin outside the giant computer and networking vendor. "We have indications that the file existed prior to Friday outside of IBM," the spokesman said. He would not speculate on how the file found its way into the IBM network.

Luckily, Big Blue had a hint of the ghost's imminent arrival. "We anticipated something like this might be attempted, so we were prepared to deal with it quickly," the spokesman said. "It may be humorous to some people, and I can see why, but we didn't treat it that way." ▣

▶ *FINANCIAL PROCESSING SERVICES*

AT&T transaction plan draws fire

Competitors claim AT&T has substantial cost advantage.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Financial institutions and other major telecommunications users last week charged AT&T with unfairly trying to use its dominance in the long-distance market to increase its share of the financial transaction processing business.

That charge was leveled in comments submitted last week to the Federal Communications Commission concerning AT&T's Comparably Efficient Interconnection (CEI) Plan for Transaction Services, which was filed with the FCC on Oct. 26.

Substantial cost advantage

"The purpose of AT&T's plan is to gain a substantial cost advantage over competing transaction processing service providers," said a joint filing submitted by Visa USA, Inc., MasterCard International, Inc., the Association of Data Communications Users and the New York and California bank clearinghouse associations.

AT&T's CEI plan would enable the long-distance carrier to sidestep some communications costs that its opponents will continue to pay, users noted. "The plan is discriminatory and inconsistent with the FCC's Computer III CEI rules," according to the joint filing.

AT&T Transaction Services enable merchants with point-of-sale terminals to interact with banks in order to process credit card and check transactions. The services include data transmission, format translation, information storage, protocol processing and data processing, according to AT&T's filing.

CEI is one of the FCC's Computer III rules enacted last year. CEI requires AT&T and the regional Bell holding companies to provide competitors with the same basic network features the carriers use in providing enhanced services.

AT&T said it will offer competitors the same transmission services used in Transaction Services and will charge itself the same tariffed rates competing providers are charged.

But the CEI rules allow AT&T and the RBHCs to collocate equipment used to offer enhanced services within central office switching facilities. In its filing, AT&T said it plans to collocate Transaction Services equipment within its central offices.

AT&T avoids local charges

This plan would enable AT&T to avoid paying for local access to connect its computer sites to its central office facilities, the Committee of Corporate Telecommunications Users (CCTU) said. Local access is one of the most costly elements of telecommunications service, according to CCTU.

"The true purpose of AT&T's CEI filing," CCTU said in its comments, "is to eliminate the need for local RBHC access services to connect AT&T's Transaction Services facilities and AT&T's central offices, thereby reducing AT&T's cost of providing Transaction Services."

According to Henry Levine, communications attorney for Visa and MasterCard, "AT&T plans to extend the economic benefits of collocation to its own Transaction Services, while withholding them from competitors. AT&T would thereby avoid 10% to 30% of the front-end costs of transaction processing."

Even though AT&T said it will charge itself tariffed rates for transmission services, a number of commenters found evidence in the carrier's filing that AT&T was not applying those rates to itself.

"AT&T apparently doesn't plan to charge itself anything for intraoffice transport, while competitors must pay an average monthly cost of $400 to $500 for each digital data service line used to interconnect a POS terminal with AT&T's central office," according to the Visa/MasterCard filing.

Telenet Communications Corp. said in its filing that AT&T will save an estimated $17 million by not charging itself tariffed digital data service rates.

"AT&T should be allowed to offer transaction processing services but should be required to do so on an equal basis. The CEI plan as filed would give AT&T a tremendous cost advantage over its competitors in this business," Levine said.

IBM opposed AT&T's CEI plan on similar grounds. IBM said the FCC should require AT&T to pay tariffed rates for digital data service circuits used in Transaction Services.

Southwestern Bell Telephone Co. supported AT&T's CEI plan in a two-page filing.

The final round of comments will be due at the FCC Jan. 8. The FCC must approve the plan before it can be enacted. In similar RBHC CEI filings, the FCC required the local companies to amend their plans to ensure competitors are charged the same rates for transmission services as the RBHCs planned to charge themselves. ▣

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▶ *ELECTRONIC DATA INTERCHANGE*

Levi Strauss offers EDI net to small retailers

BY MARY PETROSKY
Senior Correspondent, West Coast

SAN FRANCISCO — Looking for ways to respond more quickly to shifting demand in the apparel industry, Levi Strauss & Co. recently extended its use of electronic data interchange (EDI) through an agreement with AT&T.

AT&T, in conjunction with third parties, will supply the computer hardware, software and communications links for Levi Strauss' new Retailers Inventory Valuation and EDI Transmission (RIVET) program.

RIVET, which will extend EDI support to smaller retailers, is one of a series of EDI services known collectively as LeviLink, which the jeans maker introduced last fall.

LeviLink business transaction services enable Levi Strauss to exchange purchase orders, packing slips and invoices with customers electronically. The system can also be used for keeping point-of-sale information and analyzing overall market trends.

Approximately eight major retailers, representing nearly 3,000 stores, use LeviLink, said Paul Benchener, director of Levi Strauss' EDI services. Roughly 25% of Levi Strauss' purchase orders now arrive electronically. Benchener projects that some 200 small and medium-sized retailers will sign up for RIVET by the end of 1988.

EDI is defined as the computer-to-computer exchange of standard-formatted business forms, such as invoices. EDI automates communications between manufacturers and their business partners by standardizing the networking methods used to exchange electronic transactions.

Levi Strauss has been active in defining and approving EDI specifications for the apparel industry ("Garment firms to adopt EDI code," *NW*, Aug. 17).

The jeans maker originally aimed LeviLink at large retailers and chose General Electric Information Services Co. (GEISCO) as the primary network provider. GEISCO, and now AT&T, handle communications among Levi Strauss and its retailers by providing store-and-forward services, said Glenn DuBois, manager of EDI services at Levi Strauss.

"We're using electronic mailboxes on third-party networks," DuBois said. The company ruled out using dial-up network facilities due to logistical and security reasons, he said.

While RIVET users initially will use the AT&T network for EDI transmission, AT&T eventually will enable these users to tie to other networks, such as GEISCO's, DuBois said.

Levi Strauss' aggressive move to employ EDI reflects both the increased competition in the apparel industry and the need to respond quickly to changes in consumer tastes. "As retailers become more competitive, they have to cut their costs. And costs are largely represented by inventory," DuBois said.

Automating the process of tracking and ordering products helps the retailers know what's selling well and when to reorder, Benchener said. This helps Levi Strauss plan its production and compress its production cycle to be more responsive.

"What we're doing is getting smarter about how we run our businesses," Benchener said.

Levi Strauss is ahead of many of its competitors in implementing EDI, he said. And because using EDI represents a fundamental change in the way a business operates, Benchener said he believes companies that delay implementing the technology may find it difficult to catch up.

"When you're talking about electronic data interchange, the bigger concept is really quick response," he said.

"If all you're doing is establishing the linkages and getting the data quickly — and you're not doing anything else — all you've got is your data faster," Benchener said. "So we're making significant internal changes to our manufacturing process and to what we do with data that will allow us to take advantage of the electronic data interchange linkages."

Users weigh LU 6.2 schemes

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Earlier this year, Walters and a large end-user client conducted the tests as part of a project to develop an insurance policy entry system for field agents. The system will eventually allow agents working on remote Personal Computers to access policy information in a host data base using LU 6.2 protocols. Although the user initially wrote its applications to work with IBM's APPC/PC, it quickly reached the Personal Computer's 640K-byte memory limit and had to segment the application.

But segmenting the application increased the response time to retrieve a policy to more than 60 seconds. "That's a lot of time when accessing policies is what you do all day," Walters said.

The benchmark compared IBM's APPC/PC program on an IBM Personal Computer AT to Eicon's implementation of LU 6.2 executing on its intelligent communications card. The card was also installed on a Personal Computer AT. Both Personal Computer ATs were linked to an IBM host using X.25 packet-switching facilities.

The benchmark tests measured the end-to-end response time for some 30 data base-access transactions that took place under different system load conditions.

The average response time for the IBM APPC/PC approach was 53.19 seconds, vs. an average response time of 15.56 seconds for the intelligent adapter approach, said Robert Putignano, a value-added reseller who witnessed some of the testing and was given a copy of the results.

The range of response times for the APPC/PC approach was from 42 to 64.43 seconds, while the range for the Eicon approach was 8.11 to 22.46 seconds.

Despite the performance differences, Boyle said The Travelers feels the functional benefits of IBM's approach outweigh the benefits of using a third-party coprocessor approach.

Greater flexibility is one benefit. But Boyle said working with third-party APPC products would require his firm's application developers to learn how to use more of the LU 6.2 programming verbs to allow the applications to cooperate with the peer-to-peer protocol.

APPC/PC allows The Travelers to build its own functional interfaces for the developers, so that they are required to learn only four of the LU 6.2 verbs. "This allows us to get APPC applications out faster," Boyle said.

Furthermore, because IBM's Personal Computer implementation of APPC adheres more closely to the LU 6.2 architecture than any other implementation — including those that IBM implemented for its host-based programs — any application The Travelers writes to APPC/PC will have a longer life span, Boyle said.

Some third-party implementations are not as complete and could cause compatibility problems in trying to communicate with IBM host-based LU 6.2 implementations, he said.

The Travelers evaluated nine different vendors' APPC products for Personal Computers and found that many are less flexible in their support of lower level network protocols. Most products only support one scheme, such as SDLC or the Token-Ring Network. "IBM's product is completely transparent over lower level transport protocols," Boyle said. This allows users to change transport schemes without changing applications.

Others said they believe cost differences are a disadvantage in using a coprocessor. "Cost will be a big issue," said Steve Chiu, manager of product development at NSA. "The coprocessor is expensive. It's several times the cost of a dumb communications driver."

Chiu estimated that the combined cost of IBM APPC/PC software and a dumb communications card is between $400 and $500, while an intelligent communications adapter running LU 6.2 protocols will likely cost more than $1,000.

▶ *NETWORK MANAGEMENT*

Net control strategies outlined

Seminar-goers ponder issues.

BY JOSH GONZE
Senior Writer

NEW YORK — An optimal network management system must match the characteristics of the company using it, agreed attendees at a seminar on net management held here last week.

But discussion at the seminar — which was titled "Network Management: Strategic Imperatives for the '90s" — indicated the core issues of network management remain controversial. Those issues include:

- Centralized vs. distributed network management architecture.
- Proprietary vs. standards-based formats and protocols.
- Customer premises equipment-based vs. carrier network-based offerings.
- Private network control center vs. third-party service provision.

Attendees concurred on the overriding importance to both users and vendors of developing effective network management strategies.

"In the end, the user is probably going to be his own [management] systems integrator. At the very least, he is going to be his own architect," said Howard Anderson, managing director of The Yankee Group, the Boston-based consulting firm that sponsored the seminar. "And for the vendors, whoever controls network management is going to control whatever is attached to the network."

Speakers at the seminar included communications managers from prominent user companies such as Sears Communications Co. and General Electric Co., and top vendor executives such as IBM's Ellen Hancock and Digital Equipment Corp.'s William Johnson. Hancock is vice-president of the Communication Products Division at IBM; Johnson is vice-president for distributed systems at DEC. Yankee Group analysts supplemented the user and vendor presentations with their own views.

The changing nature of network traffic makes formation of a net management strategy even more difficult, speakers said. "Voice has been declining like crazy, and data is going to explode," said Stan Welland, manager of corporate telecommunications at GE. GE's network traffic is already 70% data, Welland said.

In addition, Electronic Data Interchange and software-defined networks are muddying the definition of a private network, speakers said.

Those in favor of centralized,

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ICA takes FCC to court

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The exchange carriers charge long-haul carriers special access fees for private-line services such as voice-grade analog lines and T-1 digital facilities. Access costs, which make up about 50% of the cost of long distance, are built into long-haul tariffs and passed on to end users.

The ICA claims the regional Bell holding companies have consistently engaged in so-called strategic pricing of special access since divestiture and that ICA members overpaid some $100 million. Strategic pricing does not reflect the actual cost of providing a service but is designed to achieve business objectives.

For example, certain RBHCs last year priced high-capacity special access services excessively high in order to discourage use of such services, according to tariff analysts. The RBHCs, analysts said, were trying to migrate users to switched services, which are less costly to provide.

"The FCC has promised consumers that telephone rates would be based on the cost of service, but that's not what's happening with special access," Moir said.

ICA officials said the group is hoping the legal filing will pressure the FCC to set a date for conclusion of its special access tariff investigation. If that does not happen, the ICA is expected to file briefs with the court in February, and the FCC will then have 30 days to respond. The appeals court will then review all documentation and issue its decision.

The ICA claims the RBHCs have consistently engaged in so-called strategic pricing of special access services since divestiture.

Under federal law, the U.S. Court of Appeals reviews actions of federal agencies, such as the FCC.

The ICA is also hoping the action will compel the FCC to establish limits on how much the RBHCs can increase special access rates annually.

The ICA and other users charge some RBHCs with hiking the price of special access by as much as 60% in a given year.

The ICA would like the FCC to rule that strategic pricing is illegal and that the RBHCs have earned excessively high profits on special access, Moir said.

The FCC said it "understands users' concerns on this issue and, in the past, has rejected certain strategically priced RBHC access tariffs as unreasonable," said Common Carrier Bureau attorney Lawrence Krevor.

"This is a very complex issue that the FCC is trying to resolve. But we are not at a point where we can make a definite ruling," Krevor said. The FCC has not yet set a date for concluding its investigation, he said.

Moir said that, in recent meetings with FCC officials, "I got the impression that the commission didn't plan to pursue this any longer."

Krevor said, on the other hand, the FCC is actively working on the issue.

Industry analyst Robert Ellis, president of The Aries Group, Inc. in Rockville, Md., said, "The FCC has lost interest in traditional rate-of-return regulation, including access tariffs. The FCC is looking to the day when rate caps go into effect, and they won't have to worry about access tariffs."

Rate-of-return regulation allows the RBHCs to earn a predetermined level of profit for providing services.

For each category of service, such as special access, the carriers can earn a 12% profit, but carriers have the flexibility to earn more than 12% for each particular service within that category.

The rate cap would establish a price ceiling on certain categories of telephone service and would allow the carriers to adjust their rates within the established price range without FCC approval.

Moir said the ICA would be unwilling to endorse the price cap plan until the FCC is able to resolve this issue. "The FCC isn't doing a good job under rate-of-return rules. How is it going to be able to handle a more intense form of regulation such as price caps?" he said.

MFJ may lose Greene

continued from page 2

the RBHCs out of the long-distance, information services and equipment manufacturing markets.

Critics say Greene, who presided over the Bell System breakup, has overstepped his authority by restricting the RBHCs so severely.

Chief among those critics is NTIA Assistant Secretary Alfred Sikes, who recently urged the Federal Communications Commission to ignore Greene's Modified Final Judgment order and allow the RBHCs to provide information services. The NTIA is a policy arm of the administration and has no authority to enact laws or regulations.

Sikes is leading the charge in the battle between the executive and judicial branches of the federal government, which could force Congress into the center of the conflict. Last week, the EPC's telecommunications working group circulated an options paper outlining the approaches the administration could take in drafting a bill. The bill would likely be submitted to Congress next year.

One option suggested by the NTIA would permit the RBHCs to participate in the information services market but continue to bar them from manufacturing network equipment.

Under the same proposal, the FCC and state public utility commissions would decide whether the RBHCs may offer long-distance services. But insiders questioned whether Congress has legal authority to preempt a federal District Court decree.

An administration official in favor of the bill said last week there were precedents that seem to indicate Congress could overrule Greene's Modified Final Judgment order. The official, who asked not to be named, said Congress could rule that certain provisions of the divestiture decree no longer apply.

The official said Congress took similar action in 1981 when it ruled that conditions outlined in the 1956 Western Electric decree would no longer be in effect. That decree barred the Bell System from participating in the then-nascent data processing industry.

Gerard Salemme, telecommunications policy analyst for the U.S. House of Representatives Telecommunications Subcommittee, agreed that Congress has the legal authority to reverse certain provisions of the Modified Final Judgment. "Congress could provide statutory authority for the RBHCs to enter currently restricted business areas, thereby preempting the antitrust settlement," Salemme said.

Greene's own orders say they are binding only barring congressional action, he said.

Another unanswered question is whether Congress will act on a "free-the-RBHCs" bill. "At this point, the very idea of such a bill is pure speculation," Salemme said. "This subcommittee hasn't seen any bill yet, and we have not been asked by the administration to consider it."

Congress last year failed to enact the so-called "Dole Bill," which would have transfered authority over the RBHCs and the Modified Final Judgment from Greene to the FCC.

Many Washington observers say the bill is unlikely to see the light of day because members of the Council of Economic Advisors disagree about whether the RBHCs should be given freedom from the Modified Final Judgment.

In addition, the administration and the FCC have been at odds with congressional leaders on communications issues lately.

Net control strategies outlined

continued from page 5

host-based management systems said most users cannot afford to place trained network operators at remote sites, and the coordination problems involved with a decentralized approach are too formidable. "If you're going to have unattended operation, clearly you're going to have to centralize," said DEC's Johnson.

However, a host-based system either requires a dedicated processor or risks downtime when it is most needed: when the network fails. "A distributed approach is going to cost less than a centralized approach," said Jack Freeman, senior analyst at The Yankee Group. "The effort to consolidate everything under [IBM's] NetView implies a huge investment in computer power. Meanwhile, you're seeing a drop in prices of the workstations used to display the individual system."

An odd turn of events in this debate came when DEC's Johnson found himself indirectly defending IBM against charges that its strong push for the host-based NetView is an attempt to create demand for mainframe cycles. "To think that a vendor is going to be able to force users into one or the other is crazy," he said.

The issue of open standards for network management is complicated by tension between the demand for workable systems now and the need to work toward nonproprietary systems in the future.

Most or all major vendors are paying at least lip service to the developing Open Systems Interconnect (OSI) model for network management. IBM's Hancock, for example, said, "We recognize the need to incorporate OSI in our products."

Skeptics remain unconvinced. "Most of the major vendors support standards as little as possible, as loudly as possible," The Yankee Group's Anderson said. Most of vendors' product development dollars continue to be spent on proprietary network management systems, according to Gigi Wang, director of communications research at The Yankee Group.

Anderson said common carriers, especially AT&T, are attempting to foster a market for carrier-supplied network management services. The alternative is the customer premises equipment-based solutions that IBM and other computer vendors want to sell. GE's Welland said carrier-based services have benefits, but he warned users against giving control to a single carrier.

Some users were critical of network management services such as those provided by PacTel Spectrum Services, a Pacific Telesis Group subsidiary that was represented at the seminar. Handing off control of critical networking functions is unwise, they said. PacTel Spectrum markets itself as an "extension" to in-house services and as appropriate only to companies that cannot afford to staff a net control center.

Other users urged a more flexible stance toward such services. GE maintains a network control center for its voice network but hires service providers to manage its digital switches and microwave equipment, Welland said.

Asked for hints about what to expect in future NetView releases, IBM's Hancock mentioned expert systems and voice-related applications. She said there would be "tightened architectural support for the host," implying that the amount of processing power NetView requires may be reduced.

INDUSTRY UPDATE

Telex Corp. agrees to takeover offer

Telex Corp. last week agreed to be acquired by Memorex International N.V., which said it will pay $62 a share for the 3270 terminal and communications equipment maker. Combined, the two companies will present a strong front, generating about $2 billion in annual sales, according to analysts. Morgan Guaranty Trust Co. and Drexel Burnham Lambert, Inc., both of New York, will finance the Memorex acquisition.

▶ *NATA STUDY*

CPE vendors feeling pinch

Key, hybrid system, PBX firms must seek out new strategies.

BY PAM POWERS
Senior Editor

The maturation of the key and hybrid system and private branch exchange markets over the past year has forced vendors to pursue a number of new strategies for survival, according to a recently released study by the North American Telecommunications Association (NATA).

According to NATA's "1987 Statistical Review," vendors are feeling the squeeze from sluggish demand, price erosion and foreign competition, among other elements.

NATA estimates vendors will ship a total of 4.25 million key and hybrid systems in 1987, representing only 1.4% growth over the 4.19 million systems sold in 1986.

About 4.2 million PBXs will be sold this year, as compared with 4.14 million in 1986, or about 1.4% growth for the year.

In the face of dwindling demand, NATA says vendors are resorting to cheaper prices, consolidation of operations through mergers and acquisitions, expanded product lines and alternate distribution channels.

NATA is a trade association based in Washington, D.C. that represents some 700 vendors and users of telecommunications equipment.

Key systems, defined as multiline business communications systems that provide access to a group of external telephone lines; and hybrid systems, defined as key systems that combine the network-access characteristics of both key systems and PBXs, face competition from several products, according to NATA.

Competition from other markets

High-end key and hybrid systems face encroachment from small digital PBXs. Adjunct key systems, or those that are used with PBXs, will eventually disappear due to competition from feature phones developed by PBX makers.

And stand-alone key and hybrid systems compete with increasingly robust Centrex services in the seven- to 120-station per-system market, according to the report.

PBXs, in turn, compete with hy-

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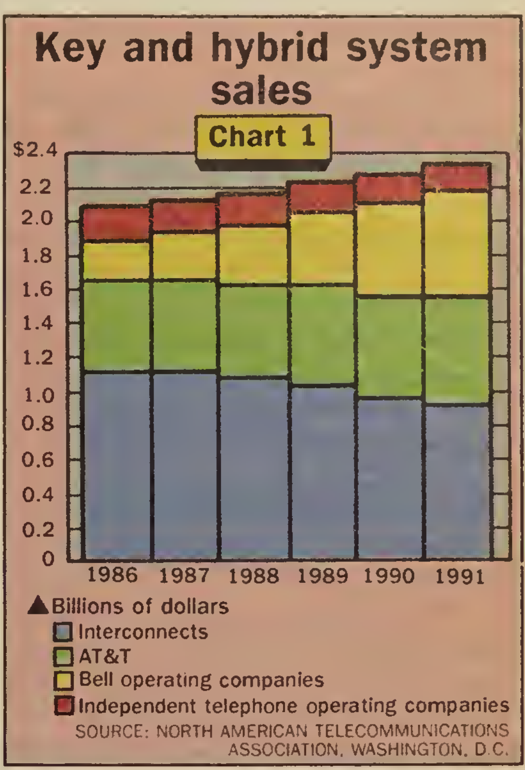


SOURCE: NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

▶ *REORGANIZATION*

IBM reassigns Rolm service, support groups

BY PAM POWERS
Senior Editor

RYE BROOK, N.Y. — In a move toward integrating its voice and data businesses better, IBM said last week it will reorganize the Telecommunications Marketing and Service operations of its Information Systems Group (ISG). ISG will incorporate the service and marketing support operations of its newly formed Rolm Systems Division.

Under the new arrangement, effective Jan. 1, the recently formed Rolm Systems Division of IBM will be responsible solely for the manufacturing and development of the CBX private branch exchange product line. Former Rolm service and marketing support personnel will report to the Telecommunications Systems Management headquarters of ISG.

An IBM spokesman said users will not be affected by the changes.

Integrated service and support

The former Rolm Systems Customer Support Division and Rolm Systems National Operations Division, which service and support Rolm equipment, will be integrated into IBM ISG's National Service Division, which provides service for all IBM products.

The Rolm arm of the National Service Division will be called Rolm Systems Service Operations (RSSO).

The Rolm Systems Marketing Division, which is responsible for Rolm product installation and customer training, will be rolled into two IBM marketing units, the North Central Marketing Division and South West Marketing Division.

Three vice-presidents will assume responsibility for RSSO and the North Central and South West Marketing Divisions.

Those vice-presidents will report to Richard Goldberg, formerly ISG group director of telecommunications special projects. Goldberg will assume the post of general manager of Telecommunications Marketing and Service. He will be responsible for all marketing and support functions for IBM/Rolm Systems voice and data products.

The spokesman said Rolm's existing network of 51 regional support staffs will remain the same. He also said customers will continue to deal with the same sales and service representatives.

▶ *UPDATE*

Corvus regroups, aims to get back in black

Firm targets low-end PC net market.

BY PAM POWERS
Senior Editor

SAN JOSE, Calif. — For Corvus Systems, Inc., 1987 has been a year of changes intended to remold the company's battered image and hoist its debt-saddled balance sheet back into the black.

Over the past several weeks, Corvus has commenced a campaign to show the public that it can reverse its downward spiral of several years to become a leading entry-level local net vendor.

> Lipton's stated goal is to return Corvus to profitability.

That strategy involves a renewed emphasis on its core business, the low-end personal computer local network market. The architect of that strategy is Lewis Lipton, appointed in May as Corvus' new chief executive officer. Lipton's stated goal is to return Corvus to profitability.

Turning a profit is no mean feat for Corvus, which has been bogged down by 11 consecutive quarters of losses that peaked at $28 million in 1986. Losses fell to $22 million in 1987.

According to William Halford, Corvus' vice-president of marketing, Lipton's strategy has begun to bear fruit. Now, halfway through a June-to-May 1988 fiscal year, Halford said Corvus "is ahead of plan to become profitable in 1988." For the fiscal first quarter ended Aug. 31, Corvus reported earnings of $273,000 on revenue of $8.2 million.

Halford said Corvus' history of losses is attributable primarily to the company's purchase of several unprofitable businesses. Between 1984 and 1986, the company purchased a disk manufacturing company, a shared resource systems company and a firm that manufactured microcomputer clones.

All have since been sold off, leaving Corvus with its own entry-level networking products.

Robert Clark, a vice-president with Infonetics, Inc., a consulting firm in Santa Clara, Calif., agreed that several unwise acquisitions contributed to "11 miserable quarters" for Corvus. "By eliminating those and going back to being a networking company, Corvus is taking a step in the right direction."

An entry-level network, by Halford's definition, serves a cost-conscious user base that wants to con-

See page 8

Corvus regroups to get in black

continued from page 7

nect a small number of personal computers. Although Novell, Inc. and IBM play in this market, Halford said, Corvus can provide the functionality necessary to those users at lower prices.

"Most of the solutions available today are too complex and too expensive," Halford said.

Corvus will address that market with its Omninet product. When configured for 10 ports or fewer, Omninet will cost about $300 per connection, compared with average costs of $750 per connection and up for competitive products, Halford said. Additionally, Halford contended that the PC/NOS operating system Omninet uses is inexpensive and easy to install and maintain.

Halford said Corvus intends, in the spring of 1988, to announce the Omninet 2, which will have a 4M bit/sec interface card. "Frankly, some think the 2M bit/sec we run today is a bit slow, and this will make us competitive from a performance standpoint," Halford said. "Omninet 2 will be as good or better than the Ethernet products on the market today," he said.

"It's not as if Corvus has a unique solution," Clark said. "Both Novell and IBM have a number of entry-level networking products. And Apple has done very well targeting small businesses with entry-level products. Corvus is running up against major, well-established players."

He said, however, that the market is growing rapidly, and Corvus might profit with even a small share of it.

Omninet is still proprietary, but Halford said it will support a number of standards sometime in the future. Eventually, PC/NOS will be capable of running on other topologies, as well, Halford said.

Corvus thinks its pared-down marketing strategy and product plans will help erase the problems of the past. "We have 400,000 nodes installed, but we have a stigma attached to us because of past financial problems — now we're working to reshape that image," Halford said.

WESTERN UNION RESTRUCTURING

Shareholders give nod

BY PAM POWERS
Senior Editor

UPPER SADDLE RIVER, N.J. — Western Union Corp. said last week that shareholders approved its proposed restructuring plan, but the company was forced again to sweeten its debtholder exchange offer in order to proceed with the plan.

The company announced last week that more than 80% of Western Union shareholders approved the restructuring, which was voted on during the annual meeting held two weeks ago.

Their approval removed one of three obstacles preventing implementation of the plan, which calls for private investor Bennett S. LeBow to buy ITT World Communications, Inc. (ITT WORLDCOM) and merge it with Western Union.

But time is running out for the company, which has said it must restructure by the end of the year to avoid bankruptcy. The restructuring cannot proceed until 80% of debtholders exchange their securities for securities in the new company and until Western Union's investment bank raises $500 million to pay for ITT WORLDCOM.

In concert with Drexel Burnham Lambert, Inc., its banker, Western Union agreed last week to add $20 million to its debtholder offer and to extend the deadline for the exchange of securities to midnight Dec. 29.

The company has declined to provide details on what percentage of its debtholders have exchanged their securities, but it has sweetened its offer several times, which suggests that it has had difficulty recruiting the 80% necessary for restructuring to proceed.

Analysts have expressed cautious optimism that the combined operations of ITT WORLDCOM and Western Union will bring the company back to profitability.

CPE vendors feeling pinch

continued from page 7

brid systems, but NATA estimates that small digital PBXs, which most PBX makers now market, will prevail over key systems and hybrid systems in the 40- to 100-station market segment.

Centrex is a more serious threat to PBXs. "Steep state-granted rate reductions for Centrex services have increased competitive pressure on PBX vendors, narrowing already-thin profit margins even further," the report states.

Centrex has the advantages of flexibility in line increases and phone company maintenance, the report added.

To combat sluggish growth resulting from a mature market and increased competitive pressure, vendors have been seeking new ways to distinguish themselves in the marketplace.

One obvious result of the increased competition in 1987 was the continuing decline in systems prices, further exacerbated by the low prices offered in the secondary market for used equipment. NATA predicts, however, that prices will bounce back, starting in 1988, as the number of vendors declines and competition becomes less severe.

The pool of players is expected to diminish, NATA says, as some vendors are forced to leave the market and others consolidate. Mergers and acquisitions continued at a rapid pace in 1987, fueled in large part by recent moves on manufacturers' parts to purchase interconnect vendors.

NATA cited Siemens AG's purchase of Tel Plus Communications, Inc., ISOETEC Communications, Inc.'s purchase of Jarvis Corp. and NEC Corp.'s interest in AIM Telephones, Inc. as examples.

New to that list, as of last week, are Vodavi Technology Corp.'s planned purchase of Executone and merger with ISOETEC, and TIE/communications, Inc.'s purchase of Honeywell, Inc.'s key systems and small PBX business.

That trend will result in increased emphasis on manufacturer direct sales, while today the largest number of key and hybrid systems and PBXs are sold through interconnects (see Chart 1 on page 7 and Chart 2 on this page).

Key and hybrid systems and PBXs are sold to end users via four primary distribution channels: interconnects, the Bell operating companies, AT&T and the independent telephone companies.

In the recent past, the report states, the interconnects have been the primary beneficiaries of uneven performance by AT&T and the BOCs in selling telephone equipment.

But NATA cautions that the tide is turning as AT&T and the BOCs become more deft in this market, and their projected future success will erode sales of key and hybrid systems and PBXs through the interconnects.

AT&T's share of the equipment market is projected to rise from 25.3% in 1986 to 28.8% in 1991. BOC sales of telephone equipment will rise dramatically, NATA says, from 11.4% of the market in 1986 to 28.3% in 1991.

Given these pressures of consolidation and increased competition facing the interconnects, their share of annual telephone systems sales will decline from 55.2% in 1986 to 35.4% in 1991, NATA forecasts.

Interconnects may continue to flourish, however, as they adopt new strategies and penetrate new markets.

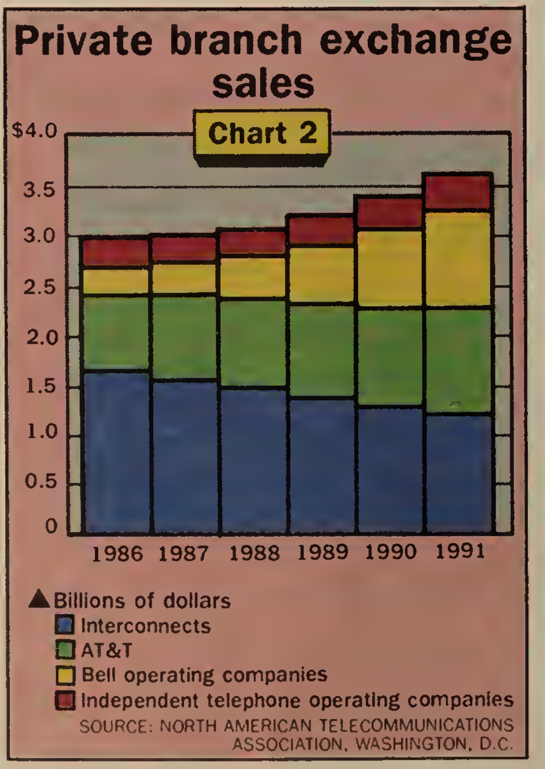
Most have expanded their product lines with an eye toward becoming systems integrators. The companies are relying on sales of add-on equipment, upgrades and even integrated voice/data solutions for specific applications.

Thus, while interconnects "will account for a declining share of annual industry-wide telephone equipment sales" in the coming years, their revenues will remain stable, NATA says.

The independent telephone companies, which today sell the smallest annual percentage of telephone equipment, about 9.6% in 1986, will continue to decline in importance as a distribution channel. By 1991, they will contribute only about 7.6% of annual equipment sales.

NATA says a number of the telephone companies have voluntarily backed off from the market because they have a geographic disadvantage with operating regions concentrated only around major metropolitan areas.

GTE Corp. remains an exception, the study says; it continues to pursue the market aggressively.


Private branch exchange sales
Chart 2

SOURCE: NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

Regulatory developments

Although NATA waged a fight against it, the Federal Communications Commission in late 1986 removed the separate subsidiary requirements for the BOCs' sale of customer premises equipment. Nonstructural safeguards have been put in place, but NATA reports apprehension on the part of independent vendors that the BOCs, through joint marketing agreements with customer premises equipment vendors, will have an unfair advantage selling network services and customer premises equipment together.

In addition to curbing BOC activities in the sale of telephone equipment, NATA has urged that GTE be subject to similar restrictions.

"GTE has been using control of local exchange monopolies to discriminate against independent telephone vendors," NATA asserts.

Emphasis on trade

Considerable emphasis was placed on the trade issue in 1987, as the House and Senate advocated the use of reciprocity restrictions and retaliatory tariffs for countries that bar U.S. telecommunications equipment imports.

NATA cautions against the use of such tactics, suggesting instead that the government work with companies in the private sector to make U.S. products more competitive in general.

It is clear that steps must be taken to reduce the U.S. trade deficit, which NATA says climbed to a record $1.7 trillion in 1986 for sales of telephones and telephone switching equipment alone.

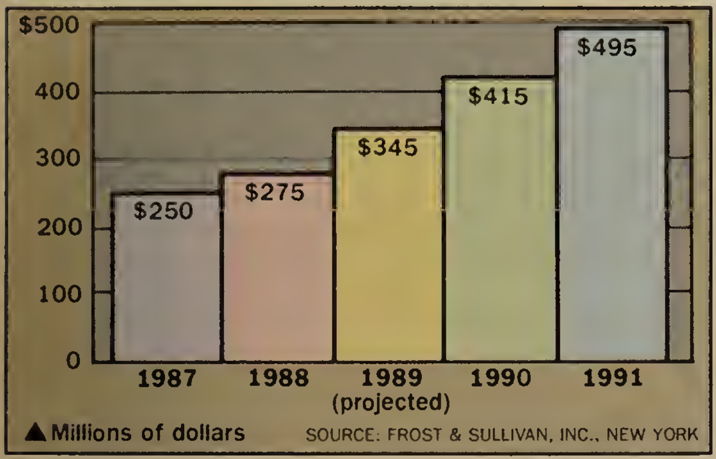
Imports, on the other hand, rose 25% in 1986. Predictably, Japan weighed in with the highest trade surplus, an 8.5% increase to $900 million.

TELECOM TRENDS

Harris PBX gives blind workers 20-20

A recent software release for Harris Corp.'s 20-20 digital private branch exchange enables blind and visually impaired workers to operate the switch's attendant console. Information normally displayed on the attendant CRT screen is converted into tones identifying incoming calls, unanswered calls and internal calls. Other tones are used to signal whether or not the destination of an attempted call is listed in the PBX's directory.

U.S. remote testing equipment market



SOURCE: FROST & SULLIVAN, INC., NEW YORK

GLASNOST

Firms provide summit service

BY MARY LINEHAN
Staff Writer

WASHINGTON, D.C. — AT&T, ITT Communications Services Group and the C&P Telephone Co. of Washington, D.C. joined to provide telephone services and equipment for the 7,000 journalists covering the recent talks between President Ronald Reagan and Soviet leader Mikhail Gorbachev held here.

AT&T installed some 500 phones at the International Press Briefing Center in the J.W. Marriott Grand Ballroom, and an additional 200 phones were installed at the auxiliary center in the Malcolm Baldridge Great Hall at the U.S. Department of Commerce.

ITT provided long-distance and overseas service, personal computer transmission, electronic messaging, and facsimile and telex capabilities via U.S. Transmission System, Inc. (USTS) and ITT World Communications, Inc.

"Where USTS has been offering long-distance service here in the U.S. for many years, our overseas service was established just six months ago," said Christopher J. Hoppin, a spokesman for ITT. "This is the first time we've offered overseas calling capability on the spot. We've got journalists registered with us, and they were able to put calls through right away."

C&P Telephone put in more than 2,000 extra telephone lines for general use and installed 300 audiovisual circuits for broadcast use at the two press centers and other locations, according to C&P Telephone spokesman Mike Houghton. C&P Telephone teamed with AT&T to provide extra lines for handling calls over the AT&T worldwide communications network and to install the more than 700 phones in the two press centers.

Jeanette Cook, AT&T manager for White House executive and international needs, said there had been surprisingly few problems. "I think we had about 12 trouble reports — dial-tone problems — here at the Grand Ballroom on the first day, but nothing really since then," she said.

The U.S. Information Agency organized and supervised services at the press centers in the Marriott and the Commerce Department.

MULTISITE INSTALLATIONS

Textron cutover follows 1-year RFP procedure

Conglomerate expects to save nearly $1m a year.

BY MARY LINEHAN
Staff Writer

PROVIDENCE, R.I. — Following an RFP process that lasted nearly a year, a large manufacturer based here awarded a bid that will save the company an estimated $80,000 a month in corporate communications expenses.

Textron, Inc. — an aerospace and commercial products manufacturer that also offers financial services — cut over the first of 15 AT&T System 75 and System 85 switches last week at a remote divisional site. The 15 switches will be installed at 12 divisional locations.

The company expects installation of the System 75s and 85s to be completed within six months. The switches, supporting a total of 13,000 lines, will replace a combination of private branch exchanges from AT&T, GTE Corp. and others, as well as Centrex services.

Each division will absorb its own costs for the new system, as well as the savings, according to Scott Maughan, a senior telecommunications analyst for Textron at the corporate branch office in Irvine, Calif. Savings were calculated by adding up the current monthly payments and rental fees incurred by each division and comparing that number to contract bids. The company expects to save about $4.5 million over five years, he said.

The equipment being replaced, as well as the new equipment, is linked by AT&T's Software-Defined Network (SDN) and private lines.

"Although the network will primarily be used for voice applications, we will use some of the digital switching capabilities for data," Maughan said, "but the data applications are pretty limited for us right now."

Maughan said the contract for the installation and maintenance of the switches at the 12 sites over the next five years is worth $8 million.

He said the company decided to save money by sending out a single request for proposal for the 12 locations rather than separate RFPs. "We were hoping to get a bigger discount by putting all the requirements together and sending it out as one RFP," he said.

"When we sat down to look over our telecommunications needs, we realized two things," Maughan said. "First, we had a number of divi-

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CROSS TALK
BOB WALLACE

Virtual net pilot tests take off

Just as a test drive in a new car helps the prospective buyer learn about the vehicle, a pilot test of a virtual private network service can help give users a feel for these new voice services.

One of the reasons users have implemented virtual private network services is to manage change in their corporate voice networks. Users say the software-controlled network services offer a flexible alternative to private lines. They have embraced services such as AT&T's Software-Defined Network (SDN), MCI Communications Corp.'s Vnet and US Sprint Communications Co.'s Virtual Private Network (VPN).

A telecommunications manager at a large aerospace company, who uses virtual private network services from two carriers, suggested prospective users pilot test the service before signing on the dotted line. "A pilot test allows the user to become familiar with the technology and develop relationships with the new carrier without a commitment to buy the service."

The manager, who requested anonymity, added, "You can get a clear idea of how each carrier's tariffs work, which enables you to better analyze which other locations would be candidates for the service."

The manager said users interested in pilot testing virtual private network services choose a few corporate locations to participate in the trial. "Users should pick a handful of locations that spend 20% to 30% of the time calling one another."

Once that's decided, it often requires some persuasion to get carriers to support the effort. Service providers prefer to channel their resources toward users that are actually planning to implement service, so potential customers have to convince the vendor that the project is for real.

"Users have to bait the hook when discussing a pilot test," the user explained. "You tell the carriers they will have a foot in the door. You say that, if they perform well, they are likely to get much more of your company's business."

The manager suggested users test multiple services, advice he said his company has followed. "By conducting multiple pilot tests, the user gains an understanding of the strengths and weaknesses of the services and how they compare to each other," he explained.

Information garnered from multiple trials becomes invaluable if the user decides to subscribe to one or more virtual private network services. "I enjoyed playing the carriers against each other," he said.

*Trademark of Northern Telecom © 1987 Northern Telecom

ANOTHER CHRISTMAS WISH!

The holidays are the busiest time of the Information Age.

Tracking toy inventories on the new Meridian* LANSTAR* local area network that connects all the elf workstations.

Checking the Who's Been Bad/Who's Been Good data base over the "Mom-Net" DPN* packet switching system.

And answering calls from millions of children phoning in their wish lists through telephone company DMS* switching systems around the world. Thank goodness Santa has a Meridian SL-1 phone system to handle all the calls.

From the Northern Telecom Family to yours: thanks for 1987, and best wishes for the happiest holiday season ever and a successful New Year.

nt northern telecom

meridian

NETWORKING

TELECOM TIDBITS

Timeplex, Inc. announced recently it had completed compatibility tests between its Link/2 Data/Voice Network Exchange, a T-1 multiplexer, and **AT&T's** System 75 digital private branch exchange. Timeplex had already completed similar tests with **Rolm Corp.'s** VSCBX and CBX II switches, as well as with **Northern Telecom, Inc.'s** SL-1 PBX. Timeplex said the Link/2 is also compatible with AT&T's Accunet T1.5 Service, which includes such functions as customer-controlled reconfiguration and M24 multiplexing.

Indiana Bell said it has sold software designed to streamline the processing of customer service orders to three telephone companies serving a combined 23 million access lines.

GTE Data Services, Inc., Pacific Bell and **Central Telephone Co.** have signed contracts, valued at a total of $4.5 million, for SOEDS Plus. The software is used to streamline service-order handling by replacing traditional paper forms and enabling service representatives to use simple commands when entering customer orders. The software was developed using hardware provided by **Tandem Computers, Inc.**

Bella Daugherty, Indiana Bell's software accounts director, said the Bell operating company won the bid over several major software houses. It will market the software in the U.S. and Canada.

AIM Telephones, Inc., a Parsippany, N.J.-based interconnect, is bidding against the big boys for several major networking contracts in New England. The projects, to be awarded next year, include a three-campus, University of Massachusetts (UMass) network valued at $28 million to $42 million. In addition to serving as a Centrex sales agent for **New England Telephone & Telegraph Co.**, AIM designs, sells, installs and services private telephone systems for users in New England, New York, New Jersey, Pennsylvania, Delaware, Maryland and North Carolina.

AIM is slugging it out with such industry heavyweights as AT&T, Northern Telecom and IBM for the UMass contract. The vendor has also been working to expand its product distribution network by acquiring other interconnects.

Last month, AIM signed a letter of intent to purchase Gray Communications, Inc., a distributor and installer of telecommunications equipment. AIM said Gray is one of the 15 largest interconnects in the U.S. AIM is best known for distributing PBXs made by NEC America, Inc., which holds a 10% equity interest in the company. ◻

Textron cutover after 1-year RFP

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sions out there looking to save money or needing to expand their systems because they were at capacity.

"The second thing we realized was that the competitive trend in the industry today — the price wars between vendors — has allowed the cost per line to drop. We wanted to take advantage of that trend," Maughan said.

The 12-site RFP was sent out to AT&T, Northern Telecom, Inc. and IBM/Rolm Corp.'s joint Enterprise Marketing Program Group.

The RFP process started in February with a needs assessment and was issued May 1, Maughan said.

> "The price wars between vendors have allowed the cost per line to drop."

There was a 90-day response period, and, after a one-month bid evaluation, the company started negotiations with AT&T. Maughan said one of the main reasons the company chose AT&T was because of the financing alternatives offered by the company.

Maughan said the company negotiated with AT&T for about a month and a half and, once satisfied, had to wait another month for the Textron approval process to be completed. "Basically, it's filled up my time all year," he said.

The entire telecommunications system is being replaced at each site, including station equipment and wiring. "We tried to narrow it down to three or four types of telephone sets to keep it simple and to get quantities up in order to keep prices down," Maughan said. AT&T Digital Telephone 7407 and 7406 models and single-line AT&T 2500 sets are being installed.

Maughan was not specific on rewiring needs but said the bid included converting existing wiring to accommodate the new systems. He also said several of the larger sites with System 85s would be rewired with fiber connections.

Maughan declined to identify the divisions receiving the new telecommunications systems. ◻

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DATA DELIVERY/ NET MANAGEMENT

GDC supports UNMA

General DataComm, Inc. (GDC) said it will support AT&T's Unified Network Management Architecture (UNMA). UNMA, announced in September, is designed to enable AT&T customers to manage different vendors' network equipment from a single terminal. GDC plans to develop a link between its network management system, NetCon-7, and AT&T's network management products.

STRATEGIC NETWORKING

Delta spurns popular travel net strategy

Airline rejects reservation system spin-off idea.

BY PAUL KORZENIOWSKI
Senior Editor

ATLANTA — Delta Air Lines, Inc. is something of an airline industry maverick, bucking the trend to spin off its network operations into an independent profit center and basing its networking future on untested equipment from a foreign manufacturer.

Calvin L. Rader, assistant vice-president for marketing automation at Delta, said competitors are making a mistake in establishing separate network services subsidiaries. "The greatest value a reservation system offers is enhancing the airline's main line of the business, selling airline tickets," he said. "The system should not be an avenue into new businesses, such as cable television."

Delta's strategy is antithetical to that of carriers such as United Air Lines, Inc., American Airlines, Inc. and Texas Air Corp. These companies have established separate subsidiaries that are marketing their reservation systems to travel agents and developing products and services needed by companies in the travel industry.

Rader's strategy may stem from Delta's last place position in the reservation network business. With 10% of the market, Delta trails American, United, Texas Air and PARS Services Partnership Co., a joint effort by Trans World Airlines, Inc. and Northwest Airlines, Inc., according to John Testa, vice-president at the Denver office of consulting firm, DMW Group, Inc.

Rader understands the company has to increase its share of the reservation system market in order to thrive in the highly competitive airline industry. During the summer, Delta introduced DeltaStar, a line of application software sold to travel agents. The applications, which run on IBM Token-Ring Networks,

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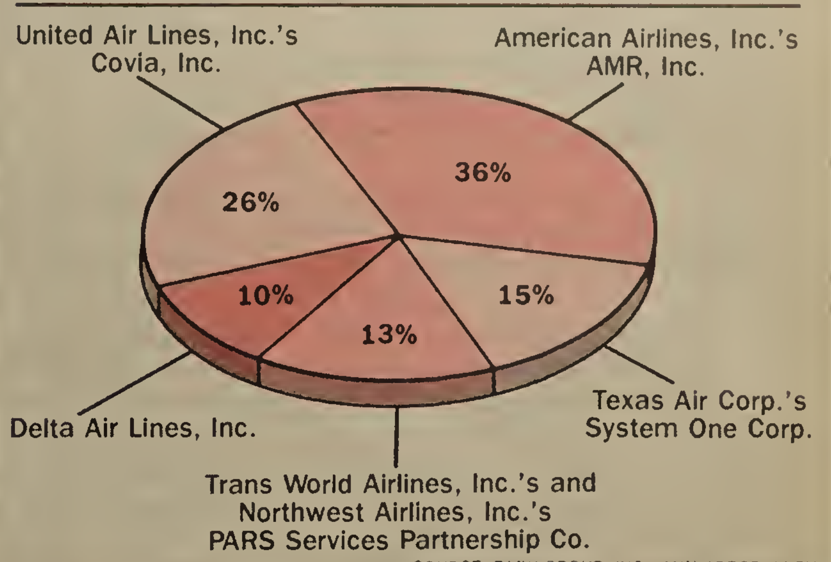

Airlines divvy up reservation system market

SOURCE: DMW GROUP, INC., ANN ARBOR, MICH.

ANALYSIS

LU 6.2 takes a step in the de facto direction

BY JOHN PICKENS
Special to Network World

IBM's LU 6.2 took another step toward becoming a de facto standard recently with an addition to Systems Applications Architecture (SAA), a set of guidelines for porting software easily across various IBM machines.

SAA outlines guidelines for four distinct functions: common user access, common communications support, common programming interface and common applications.

The new element, Communications Interface (CI), falls under SAA's common programming interface, which defines the options SAA software packages will use. CI provides a consistent way for applications to access LU 6.2 communications services, which previously were included in the common communications support portion of SAA.

Current LU 6.2 products support different interfaces on different IBM systems. For example, an LU 6.2 application running on a mainframe with IBM's CICS uses a two-step method for initiating communications sessions with remote applications, and a version running on an IBM microcomputer performs the same action with a single function. CI will abolish such differences.

IBM intends to implement CI on all SAA operating systems, including VM/SP, VM/XA, TSO/E, OS/2 Extended Edition, IMS/VS Data Communications, CICS/MVS and future System/36 and System/38 offerings.

CI will make it easier to develop applications that can be migrated from one SAA environment to another. For example, an application may be developed on a mainframe running CICS/MVS and migrated to a microcomputer using IBM's OS/2 Extended Edition. CI will enable a programmer to port the application with no modifications or only a few changes. The first set of documents describing the new interface will be available in the second quarter of 1988, and actual product implementations will follow at a later date.

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Pickens is director of communications architecture at Communications Solutions, Inc., a communications consulting and software firm in San Jose, Calif.

PRODUCT REPORT CARD

New Amdahl processor satisfies early user

Bell Canada cites speed boost as plus.

BY MARY LINEHAN
Staff Writer

MONTREAL — An early user of Amdahl Corp.'s newest communications processor cited its functional compatibility with IBM software and greater throughput as the primary reasons for investing in the product.

Amdahl's Model 4725-40, part of the new family of 4725 processors introduced by that company last September, serves Bell Canada's Montreal data processing center — one of two centers supporting the company's 15,000-user, Systems Network Architecture-backbone data network.

The fact that the 4725-40 runs standard IBM 3725 Advanced Communications Function/Network Control Program (ACF/NCP) software differentiates the Amdahl processor from the other IBM plug-compatibles currently available, according to Jack Van Ryn, a data communications advisor for Bell Canada. The 4725-30, introduced with the 4725-40, also runs the industry standard ACF/NCP software.

According to an Amdahl spokesman, the 4725 systems can be used as front-end processors or as remote concentrators, and both are able to operate in SNA or IBM Emulator Program network environments. Van Ryn said Amdahl has committed to providing functional compatibility with the IBM product line, eliminating his concern that the product will be outdated by new releases from IBM. The Amdahl processor is compatible with the IBM 3725, which was first introduced three years ago.

The vendor said it plans to provide standard IBM Token-Ring Network support in the release of an addition to the 4725 Series.

Both the 4725-30 and 4725-40 offer more throughput than Amdahl's earlier Model 4705E processor, which the vendor claimed was the fastest processor of its type on the market. The vendor said throughput of the 4725-30 is about 20% higher than the 4705E, and throughput of the 4725-40 is about 80% higher than the 4705E.

"For the customer, these advances translate into greater speed and reliability, considerably more configuration flexibility and support for a wider variety of communications links," an Amdahl spokesman said.

Bell Canada's Van Ryn said one of the reasons the 4725-40 was chosen was that the "greater

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Delta spurns travel net strategy

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automate a range of travel agent functions, such as producing reports that analyze how many flights individual agents booked during a week or month.

Delta hopes the software will entice travel agents to swap out competitors' reservation systems. Rader said that, since DeltaStar's introduction, the company has added 91 travel agencies to its stable. The demand from new customers has been so great, Delta has not yet begun shipping the software to previous customers, according to Rader.

Along with the new customers came a string of lawsuits. Currently, the reservation system business is embroiled in a legal controversy stemming from contracts agents signed with suppliers such as American. The American contracts committed the agents to American's Sabre reservation system for a certain period of time. Some agents are swapping their Sabre terminals for competitive offerings. American sued the agents and its competitors and is seeking compensation for time and effort spent training the agents and installing the equipment, as well as for "liquidated damages," or revenue the company expected to receive if the agencies had not changed suppliers.

American receives $1.75 for each ticket booked on a Sabre terminal.

Rader expects the issue to be determined in court soon. Delta is offering to pay the legal fees travel agents may incur as well as the compensation the court may grant to American. He agrees that American should receive payment for training and installation but does not agree with the liquidated damages issue.

"American is arbitrarily choosing a number of tickets an agency would book," he said. "There never was any guarantee an agency would book that number of tickets each month. Airline travel could dip, and the agency's bookings may drop."

In addition to beefing up its share of the reservation system market, Delta is revamping its backbone data network, which connects travel agents to a host computer in Atlanta. Currently, 4.8K bit/sec multidrop lines connect agents to 10 concentration points spread throughout the country. IBM Series/1 processors consolidate data and send it over 9.6K bit/sec lines to the central site.

Last year, Delta decided to upgrade the network so it could support 56K bit/sec lines from the concentration sites to the central site. Also, some of the 4.8K bit/sec lines were replaced with 9.6K bit/sec multidrop lines. The upgrade required the company to replace the IBM Series/1 processors. "We looked at every possible piece of equipment, even items that were still in development laboratories," noted Bob Woodyard, director of communications at Delta.

Only one piece of equipment, from Christian Rovsing, Ltd., met Delta's needs. It is a multifunctioning, fault-tolerant communications processor. The device multiplexes incoming data lines and supports 56K bit/sec transmission on the outbound side. Also, it acts as a protocol converter and enables different systems, such as an IBM host and Digital Equipment Corp. VAX system, to communicate. Third, the device resembles a communications processor and routes information over a network without requiring host intervention.

Woodyard said the major selling point was the device's fault-tolerant design. "In our business, we just can't afford to have our network go down, not even for one second," he said.

The selection represents a significant gamble. The processor is new equipment and has not been thoroughly tested yet. Also, Christian Rovsing is based in Denmark and has only one other pilot U.S. customer, American Airlines.

But gambles are becoming common in the airline industry. "There is a significant amount of pressure on us to develop a flexible network, so the business can shift as quickly as possible," Woodyard said.

To respond to such shifts, Delta supports an in-house support staff and maintains all of its communications equipment. The group is working closely with Christian Rovsing to debug the processor.

LU 6.2 takes a de facto step

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LU 6.2 is rapidly emerging as IBM's strategic networking protocol. IBM showcased it as a premier element of SAA and is aggressively providing support across multiple system environments. LU 6.2 supports a wide and expanding range of protocols, such as Synchronous Data Link Control, IBM Token-Ring Network and X.25. These protocols can be used with IBM wide-area networking products, such as the IBM 3720 and 3725 communications processors and Advanced Peer-to-Peer Networking, which runs on the IBM System/36.

Customers have criticized IBM for providing LU 6.2 support only on a host running CICS/MVS. Since June 1987, IBM announced or delivered support for IMS/VS, Transaction Processing Facility (TPF) and VM/SP. The company also added a direct LU 6.2 interface to the VTAM, so all mainframe application subsystems can access LU 6.2.

Support for other types of systems is equally aggressive. Currently, LU 6.2 is available or announced for the System/36, System/38, Series/1, System/88 and IBM microcomputers running either PC-DOS or OS/2.

Other vendors have noticed IBM's actions. Many suppliers have announced or delivered LU 6.2 connectivity. LU 6.2 has become a de facto standard for multivendor connectivity.

Three trends are paving the way toward eventual customer acceptance. First, processing power and storage capacity of microcomputers have increased dramatically. Second, the bandwidth available between systems, such as a microcomputer and a mainframe, has grown significantly. In a few years, microcomputers will support 4M to 8M bytes of main memory and 50M to 100M bytes of hard disk storage. The devices will be connected to 4M to 16M bit/sec local-area networks.

The most important consideration is application investment and shelf life. Applications are designed to last at least five to 10 years. Users developing a new application want the application's underlying technology to have a long life cycle, perhaps as many as 10 to 20 years. The only technology with that characteristic is LU 6.2.

Communications Solutions, Inc. a communications consulting and software firm in San Jose, Calif., recently conducted a survey of 200 Systems Network Architecture end users ("LU 6.2 use accelerates," *NW*, Nov. 2). An additional 30 to 40 in-depth telephone interviews were completed to determine customer perceptions and plans for LU 6.2.

The survey found that, while use of LU 6.2 is still limited, widespread adoption is expected within the next two years. Only 18% of the users are now using LU 6.2, but 33% are planning to implement it in one to two years. One-quarter of the users accepted the strategic role of LU 6.2 and are seriously considering usage but have not yet committed. Thus, nearly three out of every four users are either actively committed, planning to commit or seriously considering LU 6.2 implementation.

Several issues must be resolved before widespread implementation can occur. The most common complaint concerned limited LU 6.2 implementations on IBM mainframes, a hole IBM plugged during the last half of 1987. Users are waiting for delivery of LU 6.2 in VTAM, due in fourth-quarter 1988.

IMS/VS, a LU 6.2 connector, is currently available, and OS/2 is scheduled for July 1988.

Another issue was a lack of third-party application software. SAA has received wide acclaim among third-party developers, and the CI will aid developers writing new applications.

The most important missing piece concerns network management tools. Currently, most networks consist of hundreds or perhaps a thousand nodes. Network management tools are barely adequate for these networks and are not capable of managing networks of many thousands of nodes, which will become common as LU 6.2 use increases. The network management problem could be addressed by a new version of SNA.

Another problem is personal computer memory requirements. Users complain that in a workstation running PC-DOS and LU 6.2, only 10K to 80K bytes of memory remain for the application program. The memory problem will be ameliorated but not eliminated by IBM's OS/2 EE.

Another possible solution is running LU 6.2 software on an SNA gateway. The gateway offers two benefits. First, multiple microcomputers can access a host as a single SNA physical unit address, thus significantly reducing the network management problem. In addition, the LU 6.2 software is processed on the gateway workstation, thus reducing the memory requirement of each user workstation.

In conclusion, CI is good news to users and vendors alike. With consistency in the network programming interface, applications spanning different systems can be developed more easily. This new interface, combined with increased LU 6.2 support by both IBM and other vendors, points to the likely adoption of LU 6.2 as a de facto standard for distributed applications.

New processor satisfies user

continued from page 13

throughput and capacity of the Amdahl box make it a better price performer" than the other IBM plug-compatibles and the 3725 box currently on the market.

Van Ryn said the production department at the Montreal data center, where the Amdahl processor was installed about a month ago, is pleased with the product. "Overall, they are very happy with it," Van Ryn said. "They've experienced some initial kinds of problems that you expect with new technology, but Amdahl has responded very well to things that needed to be worked out."

Van Ryn said the problems the Bell Canada data center experienced were "minor compatibility problems."

Both of the new models support up to 3M bytes of memory, and each can accommodate 128 half- or full-duplex lines in the base unit and up to 256 lines. Bell Canada's 4725-40 is configured to support 138 ports.

According to Amdahl, line rates may vary from 50 bit/sec to 256K bit/sec, and, for applications requiring connection to high-speed data pathways, the processors may be used with Amdahl's Multistar T-1 Multiplexer.

Prices for the new processors range from $71,500 for the 4725-30 with 512K bytes of main memory and two line-attachment bases to $545,160 for a 4725-40 configured with six channel adapters, eight line-attachment bases, 64 high-speed communications lines, 3M bytes of main storage and the optional expansion unit. The vendor said the 4725-40 is currently available and the 4725-30 will be available in the third quarter of 1988.

LOCAL NETWORKING

> “The PC is replacing the dumb terminal as the workstation of choice, but don’t lose sight of the fact that the dominant form of connectivity is still 3270 coax.
>
> **Steve Martinez**
> Vice-president of marketing and sales
> Communications Solutions, Inc.
> San Jose, Calif.

DISASTER RECOVERY

Backup saves stock mart

High-speed network is hero in Conn. market power outage.

BY JOSH GONZE
Senior Writer

TRUMBULL, Conn. — An electrical failure knocked out computers supporting the over-the-counter stock market here two weeks ago and brought trading to a virtual standstill for 1½ hours, until a remote backup site kicked in and trading returned to normal.

The rapid recovery was made possible in part by the use of Hyperchannel local network gear from Network Systems Corp.

The exchange uses Hyperchannel to connect mainframes and independent communications processors at the main data center here and to support a T-1 gateway to link the exchange with a backup data center located in Rockville, Md.

The data centers, which are both outfitted with Sperry Corp. 1100/80 mainframes, a computer that incorporates four separate processors under one operating system, serve as the heart of the network of the National Association of Securities Dealers Automatic Quotation (NASDAQ), watchdog of the over-the-counter stock market.

The 1100/80s support Sperry Distributed Communications Processors (DCP) serving as remote concentrators in New York, Dallas, Chicago and San Francisco. The concentrators in turn support 3,500 terminals around the U.S.

Over-the-counter stock traders, known as market makers, use the terminals to initiate buy and sell orders. More than 150 million shares, or roughly 150 transactions per second, are traded per day.

Trader terminals include workstations custom-built for NASDAQ by Harris Corp. and IBM Personal Computer-compatibles that are programmed to emulate the Harris terminals. They are linked to the DCPs using 2,400 bit/sec leased lines.

The DCP terminal concentrators run Unisys Corp. communications software, called Telcom, and are linked to the mainframe sites here and at Rockville via 9.6K bit/sec and 56K bit/sec leased lines.

Data center mainframes are outfitted with channel-attached “A Series” Hyperchannel adapters. These devices support data transfer between mainframes at speeds up to 50M bit/sec.

Each data processing site also has four DCPs configured as front-end processors for the mainframes. Each front end is outfitted with a single Hyperchannel adapter for access to the Hyperchannel bus.

Information routed to either site can be forwarded to processors at the other location, according to Bob Guely, assistant director of systems applications at NASDAQ.

This flexibility enables stock transactions to be sent along whichever long-distance channels are available at a given moment. The Hyperchannel network controls both the mainframes and the T-1 circuit running between them.

Although NASDAQ’s own back-

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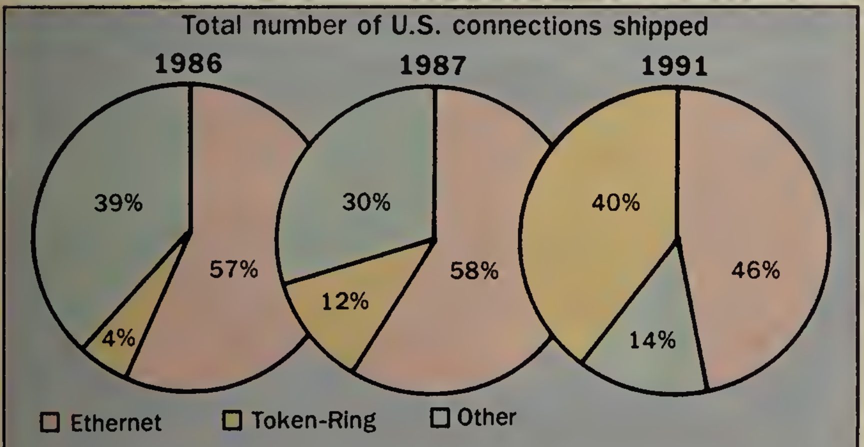
Local network market share forecast



Figures include local network connections for terminal-to-host networks.
SOURCE: DATAQUEST, INC., SAN JOSE, CALIF.

OPERATING SYSTEMS

3Com shows off 3+open software

BY MARY PETROSKY
Senior Correspondent, West Coast

SANTA CLARA, Calif. — Eager to show off its next-generation network operating system based on OS/2 and the LAN Manager, 3Com Corp. took advantage of a recent conference for its European and Asia-Pacific distributors to demonstrate an early version of its 3+open software.

It was the first public showing of the software, which is due to ship in June.

At the same time, 3Com also announced it would provide current 3+ users with a software module that will allow OS/2-based workstations to be linked to existing 3+ networks. This software, which runs on the workstation only, is due for release in the first quarter of 1988. Pricing for the software has not yet been determined.

3+open is based on the OS/2 LAN Manager, which 3Com codeveloped with Microsoft Corp. 3+ is 3Com’s

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LANMARKS

MARTIN PYYKKONEN

Fiber-optic local net market is emerging

As the demand for fiber optics has decelerated in the long-haul and metropolitan telephony markets, fiber vendors have begun to eye local loop and local-area network markets to compensate for the decline.

The economics of fiber optics in a local network environment have improved considerably in the past year. Fiber cable prices are comparable to alternative media in large local campus networks, and optoelectronic component packaging technologies are yielding steadily declining prices.

A further boost to the economic picture is that combined twisted-pair/fiber-optic universal wiring plans are rapidly gaining market acceptance, allowing users to efficiently plan the right media for a given bandwidth application or geographic area.

The intrinsic benefits of fiber-optic technology have been well known for several years, but only recently have users begun to identify specific applications related to local networks. The following is a brief description of some fiber-optic local net applications that are gaining ground in the market:

Near term (one year)

- **Backbone transport.** This involves the application of a telephony concept to an office or campus environment for moving data. This application also includes the use of telephony equipment, such as a DS1 interface, adapted for use in a smaller geographic environment for local net applications.
- **Multiple local net bridge.** This application is similar in geographic scope to the backbone transport local net, but the focus is on connectivity between users and resources attached to multiple and dissimilar local networks. Such bridges, which connect the entire user universe, provide flexibility in moves and changes within each net.

Longer term (two to three years)

- **High-performance workstation interfaces.** As workstation computational power increases dramatically, higher bandwidth pipes will be needed to transport large data and graphics files directly. Today, such applications typically involve downloading and uploading host files but in the future will be increasingly peer-to-peer.

In summary, today’s local-area network applications for fiber optics focus on backbone transport functions, where volume and distance economies of scale can be realized. Tomorrow’s applications will be driven by advanced distributed computing that will require high-bandwidth interfaces to the end user’s workstation.

Pyykkonen is a senior consultant with Arthur D. Little, Inc. in San Francisco.

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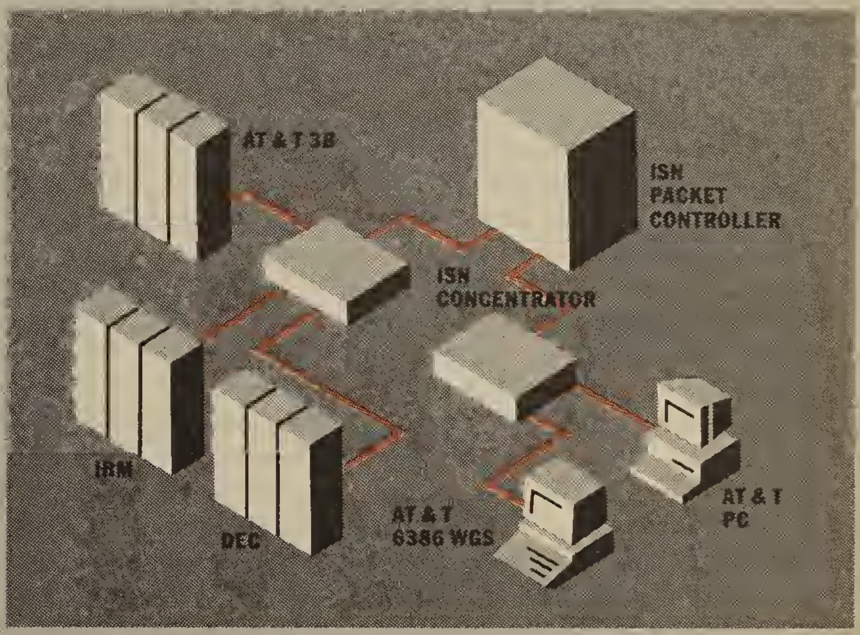
AT&T comes through.”



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NETWORK NOTES

Forty percent of Transmission Control Protocol/Internet Protocol users have specific plans for migrating to the International Standards Organization's Open Systems Interconnect (OSI) standards, according to a report released last week by **Newton-Evans Research Co.**

Of the 105 data communications officials surveyed, about one-third were uncertain about migrating from TCP/IP to OSI, and the remaining 26% were not considering such a move, according to the study, which was titled "Interconnectivity: The Role of TCP/IP."

Three-fourths of users said they were aware of the protocol, according to the survey, and, of those, 79% are either using TCP/IP in their networks or are planning to do so.

Users surveyed said they look primarily to **Digital Equipment Corp.** and **Sun Microsystems, Inc.** for TCP/IP products, services and support, but they also mentioned **The Wollongong Group, Inc., Excelan, Inc., Proteon, Inc.** and **Bridge Communications, Inc.**

The report, priced at $995, is available from Newton-Evans Research, 3220 Corporate Court, Suite A, Ellicott City, Md. 21043, or call (301) 465-7316.

Hyundai Electronics America recently introduced a new file server, marking the firm's entrance into the local net market. The Super-286 is a 12-slot Intel Corp. 80286-based Personal Computer AT that can be configured as a network file server or as a stand-alone workstation for computer-aided design and manufacturing, desktop publishing and data base management, according to the company. Priced at $1,999, the Super-286, with a 101-key keyboard, is currently available.

Apollo Computer, Inc. recently announced the availability of Manufacturing Automation Protocol 2.x on its high-performance workstations. Apollo workstation users will now be able to communicate with factory floor devices, including computer numeric control machines, Programmable Logic Controller robots and vision machines. The MAP products supported on Apollo workstations include a Personal Computer AT-compatible MAP 2.1 controller card that resides in an Apollo Series 3000 Personal Workstation or Series 4000 Personal Super Workstation, allowing these workstations to connect to MAP local nets.

Apollo also announced an enhanced version of **Applix, Inc.'s** Alis office automation software that provides distributed file access to networked Apollo workstation users. The enhanced Alis DL provides distributed logon capabilities that allow users at any networked Apollo workstation to access their Alis files. Because the enhanced program takes advantage of Apollo's distributed file system, workstations do not have to run a copy of the program to provide distributed access to Alis files in other workstations. Previously, users could only access Alis files from their own workstations.

Alis is an integrated office system package that provides word processing, a spreadsheet function, data management and business graphics functions. It operates on Apollo's Domain Series 3000 Personal Workstation and Series 4000 Personal Super Workstation.

HP-UX 6.0, **Hewlett-Packard Co.'s** latest release of its implementation of AT&T's Unix System V operating system, supplies support for Network File System Release 3.0. Such support gives users a de facto standard method of transparently sharing files within a heterogeneous network. HP-UX 6.0 also supplies diskless computing capabilities integrated with the kernel, making it appear to diskless users that they are working on a multiuser machine but giving them the power of a high-performance workstation.

Bridge Communications, a division of **3Com Corp.,** has introduced a software package that connects Digital Equipment Corp. VAX and MicroVAX systems on a TCP/IP-based Ethernet or Bridge 5M bit/sec broadband local-area net. The new V/IP software, which provides full terminal connectivity and file transfer without the addition of non-DEC hardware, is being resold by Bridge under a multiyear license with its developer, **The Wollongong Group, Inc.**

Bridge also announced it has inked a two-year, $5 million OEM contract with Dallas-based **Pritronix, Inc.** Pritronix, which provides large microcomputer users with third-party communications support, will sell and service all of Bridge's networking products, including Ethernet, token-ring and broadband servers as well as internetworking products and network management stations.

Novell, Inc.'s Communications Products Division (CPD) has announced a $75 rebate for U.S. end users that purchase PCOX/COAX and PCOX/Remote interface boards between Dec. 1, 1987 and Jan. 21, 1988. Rebate cards for the products, which provide connections from IBM Personal Computers to IBM mainframes, are available through Novell distribution channels, and customers must return them with proof of purchase to Novell's CPD in order to receive the rebate.

General Computer Corp. and **TOPS, A Sun Microsystems Company,** recently announced a program that will give current owners of General Computer's HyperNet the opportunity to purchase TOPS' TOPS/Macintosh Version 2.0 at a reduced price. Under the agreement, TOPS, which is administering the program, will provide up to five copies of TOPS/Macintosh 2.0 for $59 per unit in exchange for each HyperNet master disk.

The current suggested retail price of TOPS/Macintosh 2.0 is $189.

General Computer also announced that it has stopped marketing Hypernet. "General Computer has decided to focus its resources on the opportunities it has in the mass storage, performance and printer segments of the Apple [Computer, Inc.] Macintosh marketplace. After reviewing the existing networking products, we feel this agreement will give our customers the best possible alternative to get HyperNet at an extremely affordable price," said Mark Flanagan, vice-president of marketing, sales and service for General Computer.

3Com shows off 3+open ware

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current network operating system, which is based on the MS-DOS operating system.

The 3+open demonstration involved two Personal Computers from Compaq Computer Corp.: an Intel Corp. 80386 microprocessor-based machine that acted as a network server and workstation simultaneously, and an Intel 80286-based machine that acted as a workstation.

The two machines were linked using 3Com EtherLink Plus adapters to attach to an Ethernet local network, and both ran OS/2 as the underlying operating system.

During the demonstration, 3Com Product Manager Alan Kessler ran a batch program that simulated network activity such as sharing of files, printers and modems. The server's ability to function as a workstation running multiple sessions was also demonstrated, as were network security features, session management and pull-down menu windows.

During the demonstration, 3Com Product Manager Alan Kessler ran a batch program that simulated net activity.

"Clearly, we have a stake in OS/2 networking, and it was important for us to make a statement," he said.

"Clearly, we have a stake in OS/2 networking, and it was important for us to make a statement," Kessler said.

Bob Clark, a senior analyst for local network hardware at Infonetics, Inc., a research firm in Santa Clara, Calif., said he has not seen 3+open operate but that Microsoft recently showed him a demo of LAN Manager.

"The presentation was very impressive," Clark said. "We saw four or five tasks working simultaneously on the server and the workstation. It was impressive."

Clark said he had been somewhat skeptical of Microsoft and 3Com's ability to implement in LAN Manager all of the functionality the two companies had promised.

Backup saves stock mart

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up generators would normally have stepped in when the utility serving the data center here failed, a power surge damaged NASDAQ's generators, making it necessary to off-load the entire system to the backup system in Rockville.

It took roughly 1½ hours to warm up the Rockville site after the Connecticut power failure, Guely said. Once it was up and running, Hypercharmel automatically routed all data coming into the facility here over to the Rockville site.

"Everything on our system is redundant, so there should be no single point of failure," according to Guely.

Each Hyperchannel adapter is a microprocessor-based unit containing a common trunk interface to the coaxial cable, control logic and data buffering to accommodate the different transfer rates of various equipment. The adapter uses a proprietary transmission format and protocol. Receiving adapters reverse the process.

It took roughly 1½ hours to warm up the Rockville site after the Connecticut power failure. Once it was up and running, Hyperchannel automatically routed all data coming into the facility here over to the Rockville site.

The Hyperchannel systems allow the front ends at each DP site to route messages to any processor on either the local or the remote mainframe. "The front ends don't really care — they just put it out there on the Hyperchannel, and the transaction ends up in whichever host the application is running," Guely said.

Hyperchannel also controls the updating of the backup site. "We have to keep Rockville pretty much up to date if they're going to be our backup system, so we're continuously forwarding them the latest transactions and copies of our data base," Guely said.

The other problem Hyperchannel solved was a spaghetti of leased telecommunications lines linking remote concentrators with the mainframes. "Our host can connect up to the Hyperchannel, so now, rather than having a communications line between each front-end processor and each application host, we just have logical sessions."

COMMUNICATIONS MANAGER

> “An increasing number of companies are using incentive pay programs to motivate employees. In addition, companies are extending the incentives to engineers and technical employees, who, traditionally, were excluded from incentive plans aimed at upper- and middle-level management.
>
> **Mark Edwards**
> Senior consultant
> Sibson & Co.
> A human resource consulting
> company in San Francisco

HIRING PRACTICES

Hiring complicated by raft of false resumes

Experts estimate 30% of resumes may distort truth.

BY MICHAEL FAHEY
Senior Writer

Recent events in the campaign for the Democratic Party presidential nomination have underscored the need to check credentials carefully. Sen. Joseph Biden of Delaware, after all, is not the only job seeker willing to misstate his qualifications.

In fact, according to Peter LeVine, president of Peter LeVine Associates, Inc., a professional reference checking firm in Framingham, Mass., 20% to 30% of the resumes submitted to prospective employers are fraudulent.

And the actual percentage of false resumes may be even higher. “The only ones caught are the ones that are checked,” LeVine said. “But a minute fraction of applicants for a job get to the point where their credentials are checked.”

Evaluating job candidates has become more difficult recently because of a rash of lawsuits lodged against former employers who passed on poor recommendations, said Robert Half, chairman of Robert Half, Inc., a worldwide personnel recruitment company headquartered in New York. In a recent survey, 40% of the respondents said they would not offer a frank reference, even to a friend, Half said.

How can employers ensure that new employees are what they purport to be? The most important step, and one that is reasonably simple, is to check a job candidate’s educational credentials, according to LeVine.

“This is a litmus test of integrity,” LeVine said. “If people falsify their academic credentials, which you can verify, there is a good chance that they will falsify other things that you will not be able to verify.”

LeVine also counseled against confusing a re-

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Tips for checking a job candidate’s background

1. Verify educational background.
2. Interview a job candidate’s peers, subordinates and former supervisors, when possible.
3. Ask neutral but focused questions when interviewing references.
4. Ask references questions that are relevant to the job in question.
5. Distinguish between a referral and a reference.
6. Conduct reference checks by telephone.

SOURCE: PETER LEVINE ASSOCIATES. INC.. FRAMINGHAM. MASS.

JOB HUNTING

Realizing resume potential

Fortune 1,000 execs list mistakes candidates make.

BY MICHAEL FAHEY
Senior Writer

Neatness counts when it comes to resumes. So does clarity and honesty, according to Robert Half, chairman of Robert Half, Inc., a worldwide recruitment company that boasts of finding jobs for more than 100,000 people.

Half’s organization recently commissioned an independent research company to survey vice-presidents and personnel directors at Fortune 1,000 companies on the mistakes job candidates make on their resumes.

Thirty-six percent of the executives cited lies or distortions as common problems on the resumes they receive. Resumes that are too long were cited as shortcomings by 21%, and messy resumes filled with typographical errors and misspellings crossed the desks of 19% of those who participated in the study.

Resumes that do not contain enough specific information were cited by 12% of the survey respondents. Irrelevant material was a mistake cited by 11%, 10% of the executives thought job seekers erred in not listing job accomplishments, and 2% cited overly brief resumes.

Self said job seekers should place more emphasis on listing accomplishments. “A resume without achievements is empty,” Half said. “List the little things that made a company or department just a trifle better than it was before you got there.”

Job seekers should have more than one resume if they have a variety of skills that are suitable for a number of jobs. And, Half said, job candidates should be prepared to put together custom resumes for particular jobs. “It is certainly worth the effort,” he said. “Looking for a new job is a very important thing that can positively or negatively affect your entire life.”

Half said resumes should be as concise as possible but added that trying to cram too much information into too little space is a mistake. “I’m not one who says it has to be no more than two pages,” he said. “I’ve seen one-page resumes that were too long because they didn’t say anything.”

Half also cautioned against gimmicky resumes that include pictures or resumes that are done on brightly colored paper. He recommended investing in white or ivory high-quality bond paper.

GUIDELINES

ERIC SCHMALL

Give meaning to the data nomenclature

Trying to keep a reasonable perspective on the volume of information flow these days is no simple task for communications managers.

Users casually talk of the need to move huge files that contain millions of characters of data. In fact, almost no one even talks in terms of millions anymore. Nowadays it’s a “meg” or two of data needed.

We are all becoming as accustomed to large numbers as legislators are to federal budget figures. It has been more than 20 years since the late Sen. Everett Dirksen (R-Ill.) chided his colleagues about glibly using large numbers by saying, “You know, a billion here and a billion there — before long it adds up to some real money.” Communications managers face a similar dilemma in confronting the unrelenting demand for more data movement.

Since it’s become relatively easy for humans to conceptualize hundreds and even thousands of units — whether they be dollars, people or bits — communications professionals certainly feel comfortable with the technology that sends data down a line at 300, 1,200 and even 9.6K bit/sec.

Wideband communications technology involving T-carrier rates and local-area network media has taken us to the realm of millions of bit/sec. Fiber optics will no doubt deliver us to a plateau of billions of bit/sec. And, with all due respect to the scientists and engineers who devote their lives to such improvements in speed, somebody occasionally needs to step back and ask what it all means.

Part of the problem is the handy way these massive numbers can be reduced to simple, two-syllable Greek prefixes: kilo- for thousand, mega- for million and giga- for billion. Standing in the wings, little known, higher orders of magnitude await: tera- for trillion, peta- for quadrillion and exa- for quintillion.

These are simple terms, each evoking yet another incomprehensible array of figures.

To break the spell of these large numbers, a manager needs to keep some sense of relative size. Start with a single sheet of double-spaced typewritten data. If such a page contains 200 words, averaging seven letters per word, this page contains 1,400 characters, or 11,200 bits. An “average” book of 500 impressions, or 250 actual pages, will usually hold

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Schmall is network systems manager for an insurance holding company.

▶ *MANAGEMENT REPORT*

Chargeback systems should reflect needs

BY MICHAEL FAHEY
Senior Writer

In an effort to offset costs and produce revenue from their communications operations, many organizations are implementing chargeback systems in which end users pay the networking services costs.

But managers planning to institute chargeback schemes should bear in mind that there is no one ideal chargeback system, according to a recently released report by Input, a Mountain View, Calif.-based consulting company.

"No single approach is best for all companies," the report said. "Before implementing any form of chargeback system, an organization should develop a clear set of objectives for the system."

Furthermore, the report notes, the objectives must have the support of top management.

The Input report points out that chargeback system objectives generally fall into three major categories: Informational, motivational and accounting.

Informational chargeback systems promote awareness of the costs of services and are a means of capturing data for planning and budgeting purposes.

Motivational chargeback systems encourage experimentation and using new technologies.

Chargeback systems designed for accounting purposes are often used to provide financial data for legal and tax reasons.

The report points out that informational and motivational chargeback systems are generally less formal than chargeback systems used for accounting purposes.

Managers must remember that the industry in which a company is involved greatly influences the objectives and the design of a chargeback system, the report said. For example, companies in the insurance or aerospace industries must meet government accounting regulations. Thus, chargeback systems must meet stricter requirements.

In some organizations, the way costs are calculated to meet regulatory requirements may not be the most effective means of charging back costs to internal users, according to the report. In these instances, two separate chargeback systems may be necessary.

Many companies use chargeback systems for a number of services, including transportation, printing and legal services. A chargeback system for communications services should operate with the same basic objectives and policies as other chargeback systems employed by the company, the Input report points out.

For more information on the report, which is entitled "Chargeback Systems," contact Input at 1280 Villa St., Mountain View, Calif. 94041.

False resumes complicate hiring

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ferral with a reference. Even when trusted sources refer job candidates, prospective employers should treat such referrals as recommendations, not as references attesting to the candidates' suitability for particular jobs, he said.

Half agreed, but added, "It is still a good way to get people. Just remember that you owe it to yourself to check their references."

In addition, he said, prospective employers should quiz those who are recommending candidates who are former employees. "Ask why they left. Do they plan to replace them? Would they rehire them?"

When possible, employers should interview job candidates' fellow workers, subordinates and former superiors, said Barbara Jordan, LeVine's associate.

When prospective employers discuss potential new hires with their references, they should ask neutral but focused questions pertinent to the jobs they are trying to fill, LeVine said.

"You don't want to lead people and influence their responses," he said. "You also don't want to waste time asking questions that are not relevant."

LeVine said conducting reference checks by telephone helps keep interviews focused on the subject at issue: the candidates' suitability for employment.

Many companies scrutinize new employees but fail to check out employees who are promoted into positions from jobs within the company.

Half recommended a simple but effective means of checking out job candidates who use former employers as references. He advised calling former employers and reading them the job candidates' descriptions of their former duties as stated on their resumes. "Then," Half said,"listen if you can hear the former employer's lower jaw hitting his chest.

"I've seen a number of resumes of people who formerly worked for us," he said. "When I read their resumes, I wondered how we existed without them."

Half also recommended that prospective employers take notes during job interviews so that they are better prepared to check out the candidates' description of their qualifications and previous work histories. "When you interview people, you should tell them that you check references and that you expect them to answer questions in the same manner as would their references," he said.

While he said prospective employers should carefully scrutinize job candidates to eliminate unsuitable applicants, Half warned against eliminating good candidates for superficial reasons. This is particularly important in the case of hard-to-fill technical positions, Half said.

"If you find qualified technical people," he said, "don't let your personnel department eliminate them as candidates just because they make Einstein look like a fashion plate."

Give meaning to nomenclature

continued from page 19

700,000 characters, or between 5M and 6M bits.

The latest edition of the *Encyclopedia Britannica*, for example, consists of 32 volumes containing 44 million words totaling somewhere in the range of 2½G to 3G bits.

A boxcar or two of 350 complete sets of the *Encyclopedia* would yield close to a trillion bits, or a terabit, of data. Even with these informal guides, it is possible to regain some sense of proportion absent from the kilo-/mega-/giga-/tera- nomenclature.

Despite the inexorable push of technology and the endless creation of data that needs to be exchanged, manipulated and stored, communications managers still have an obligation to question the appropriateness of massive data movement. Ten years ago, one could easily dismiss a request for a megabyte file transfer because the prevailing transmission technology couldn't possibly handle the delivery in the time needed, say overnight, for example.

Now that the technology will permit such a transfer, the alternatives should nonetheless be considered. Why should the organization spend the time, talent and money to install wideband lines to support significant mass data flow? Who will read all this data?

Why can't it simply be looked up in some on-line data base? Why can't a file extract be sent instead of the entire file? Reminding both users and key decision makers about the true size of a megabyte file might help keep everyone's perspective clearer on this crucial issue.

For example, the communications manager might observe that a file being transferred equals three *Encyclopedia Britannicas* of information each workday. That is bound to have a more profound impact than using the increasingly meaningless term "a few meg of data."

It will continue to fall to the communications manager to remind the senior staff that a few gigabytes here and a few gigabytes there — pretty soon you're talking about some significant data.

DIALOGUE

Do you think the recent flurry of mergers and acquisitions in the networking industry — for example Unisys Corp.'s acquisition of Timeplex, Inc. or the merger between 3Com Corp. and Bridge Communications, Inc. — will have an effect on you as a user?

“I think in the long run, it may be good for the industry because the vendor companies may become more financially stable.

Right now, it's sometimes hard to determine who will be in the industry for the long run. These mergers make it easier for us as users to make those decisions.

Christopher Davis
Vice-president of
telecommunications services
Rexnord Data Systems
Milwaukee

“I generally view mergers as good because they allow for the combined resources of the companies involved to be used to develop valuable solutions for users. Also, the companies are likely to be with us for a longer time as result of the mergers.

Many companies start up with new ideas that are not always funded sufficiently and, therefore, might not have staying power. Market acceptance and so on might not always occur rapidly enough to sustain them.

Thus, the technical and business experience of a larger organization would have a positive influence.

Robert H. Paretchan
Manager of telecommunications
CertainTeed Corp.
Blue Bell, Pa.

“All in all, I think it's good, mainly because of the improvements in field service support. I don't think there will be that much difference in the product lines in the near future. We've dealt with Timeplex, and we've found that their product line is great, but their field service wasn't enough to go nationally.

With a national company like Unisys, perhaps they'll be able to cross-train their support staffs with those of Unisys and improve their field support.

Jeffrie A. Chirchirillo
Technical officer
The First National Bank of Chicago
Chicago

“As long as our choices don't become too limited, I think it will be good for the industry.

Jerald V. Marcone
Assistant vice-president
of telecommunications
Crum & Forster Corp.
Morristown, N.J.

“At this point, I couldn't really say. As far as mergers in general, I think they should be viewed on a case-by-case basis.

Mark Diemer
Telecommunications network coordinator
State University of New York
Central administration
Albany, N.Y.

NEW PRODUCTS AND SERVICES

See page 39 for:
▶Fiber-optic multiplexer product comparison

First Look

Microcom introduces 19.2K bit/sec modem

Microcom, Inc. introduced a 19.2K bit/sec dial-up modem that supports both asynchronous and synchronous data.

The **HD/9624c** also supports Levels 1 through 6 of the Microcom Network Protocol (MNP) error-checking scheme. The new modem supports what Microcom calls statistical duplexing, a function of MNP Level 6 that enables the modem to emulate full-duplex transmission. Statistical duplexing is said to increase file transfer throughput or support interactive applications.

Compatible with Bell 103 and 212A as well as CCITT V.22 and V.22bis standards, the HD/9624c supports automatic adaptive line equalization and autofallback rates of 2,400 bit/sec, 1,200 bit/sec and 300 bit/sec. Other features include autodial, redial of a busy number and autoanswer.

The new modem can be used in Microcom's High Density Modem System (HDMS). Up to 16 of the modems can fit in a 19-in. HDMS rack. The HDMS system supports such network management functions as operational statistics, callback security, modem control and diagnostics.

The HD/9624c is priced at $1,379.

Microcom, Inc., 1400 Providence Highway, Norwood, Mass. 02062, or call (617) 762-9310.

Phone tariff analysis ware, rate book released

Economics & Technology, Inc. (ETI) released an IBM Personal Computer-based software package designed to price leased circuits. The company also released a handbook listing prices for intercity leased lines and switched services.

The telecommunications consulting firm's **Private Line Pricer/AT&T Edition** software provides communications managers with a data base of current rates for AT&T leased lines that support traffic between local access and transport areas as well as within a LATA.

The data base included with the software is updated quarterly. With the software, managers are able to calculate monthly line charges and verify AT&T billing.

ETI's two-volume **Intercity Rates Handbook** contains a listing of available services nationwide and their costs. The set consists of a Private Line Volume and a Switched Network Services Volume.

The volumes, which are updated monthly, also contain service selection guides and vertical and horizontal coordinates, which pinpoint the exact location of telephone central offices.

The handbook includes services and rates for AT&T, MCI Communications Corp., US Sprint Communications Co., ITT Corp.'s United States Transmission Systems, Inc., Western Union Corp., Allnet Communications Services, Inc. and National Telecommunications Network. It also includes listings for the Bell holding companies and major independent carriers.

The Private Line Pricer/AT&T Edition software costs $995 and includes three quarterly data base updates. The cost for receiving four additional quarterly data base updates is $495.

The two-volume Intercity Rates Handbook costs $695 per year and includes 12 monthly updates.

The Private Line Volume and the Switched Network Services Volume can be purchased separately for $425 each.

Economics & Technology, Inc., 101 Tremont St., Boston, Mass. 02108, or call (800) 225-2496. In Massachusetts, call (617) 423-3780.

▶ *TELECONFERENCING*

Telephone bridge links up to 15 callers

BY JIM BROWN
New Products Editor

CARROLLTON, Texas — DSP Technology Corp. recently introduced Confer-M, a teleconferencing bridge that enables up to 15 people to call a central telephone number and join a teleconference call.

Confer-M is a customer premises device that can be used stand-alone or in conjunction with an analog private branch exchange or an analog port on a digital PBX.

Used stand-alone, the product supports a group of five central office trunks sharing the same telephone number. Used with a PBX, the unit links to a line card capable of supporting five incoming lines.

As many as three teleconferencing bridges can be linked using a cable, dubbed a Confer Coupler, and the control or monitor port of each bridge. No additional trunks or line cards are needed. That port determines the number of additional parties that can be added to a teleconference.

When linked, the three bridges will enable 15 parties to join a single teleconference call or support three separate teleconferences of five people each.

With a stand-alone version of the product, users call a single telephone number to access the bridge. After answering a call, the bridge digitizes incoming voice at 64K bit/sec and sends a beep tone to inform parties already involved in the teleconference call that a new party has been connected.

When the bridge is used with a PBX, users can access it through direct inward-dial trunks or be transferred to the device by an operator. A user or operator can call individuals, either internal or external, and transfer those calls to the bridge.

A company spokesman said the product digitizes voice to compensate for the loss of signal strength that occurs when several analog lines are interconnected. Digital signals, he said, have a constant signal strength, regardless of the number of lines interconnected.

The digitization also enables the unit to detect which party is speaking and open a speech transmission path for that person. The spokesman said the device can simultaneously support a speech path for each of the teleconference parties.

The product is compatible with Shared Resource Exchange, Inc.'s System One, NEC America, Inc.'s NEAX 2400 Information Management System and Northern Telecom, Inc.'s SL-1 PBXs.

Each Confer-M teleconference bridge is priced at $2,195. A Confer Coupler cable is priced at $300.

DSP Technology is located at 1325 Capital Pkwy., Carrollton, Texas 75006, or call (214) 245-8831.

▶ *VOICE-FREQUENCY CARRIERS*

Pirelli fiber-optic system replaces microwave links

WALLINGFORD, Conn. — Pirelli Communications Systems recently introduced an analog fiber-optic system designed to replace existing analog microwave links.

Pirelli's MVS 100 consists of one pair each of transmitters, receivers and chassis. It will work with 1,300-nm or 1,500-nm single-mode, fiber-optic cable and uses laser beams as a light source.

The MVS 100 will support transmission of up to 1,800 voice channels over distances up to 24 miles. It is aimed at telephone companies and large end users that use voice-frequency carrier multiplex systems such as the LMX carrier made by AT&T Technologies Corp., formerly Western Electric Co., and GTE Linkert Corp.'s 46-A3 carrier system.

Voice-frequency carrier systems use several steps of frequency division multiplexing to assemble up to 1,800 voice channels on a single link.

The MVS will also support transmission of one video channel received from AT&T video modulation equipment. When used with Pirelli's 1800 Series of video modulation equipment, the MVS 100 will support transmission of up to 14 video channels.

A Pirelli spokesman said internal tests show the system could be configured to support a 135M bit/sec analog data transmission link using a quadrature amplitude modulation technique. He said the company has not yet field-tested the system for data transmission.

A pair of MVS 100 transmitters costs $28,000, while a pair of receivers costs $14,000. The pair of 19-in.-wide chassis that house a transmitter and receiver at each site costs $2,000.

Pirelli Communications Systems is located at 2 Tower Drive, P.O. Box 5031, Wallingford, Conn. 06492, or call (800) 523-7893 or (203) 284-1680.

EUROPEAN NETWORKS

RICHARD T. KEARNS

Privatization is the key

From recent headlines in the trade press, it would appear that barriers to installing and maintaining private data networks in Europe are not much higher than in the U.S. Yet appearances can be deceiving. While many previously forbidden activities are now commonplace, the integration of a private net across borders is still a formidable task.

Although regulations are, in fact, more relaxed, there is still a tremendous distance to go before they approach the laissez-faire system common in the U.S. For example, equipment permitted in one country is not necessarily allowed in another. Although this burden is scheduled to be removed in 1989 with the new European Economic Community (EEC) common approvals procedure, initial approval may still take many months to obtain.

Some Post, Telephone and Telegraph administrations allow domestic circuits to be ordered only by a locally registered company, and most PTTs will bill for these circuits only within their own countries. This forces a private network supplier, perhaps serving multiple divisions of a single company, to establish local accounts, bank facilities and tax provisions in each country. For a similar example, imagine each Bell operating company in the U.S. accepting only a check drawn by a local company on a local bank at each end of each circuit for payment.

The supposedly simple act of ordering circuits in Europe can be very complex. Both ends of an international circuit must be ordered from different PTTs, and, all too often, it is the customer who must coordinate the operation. Delays in installation can be quite severe, with significant financial penalties for cancellations. Even worse, there is little consistency; the international circuit may come in on time while the domestic circuit may come in several weeks late. Thus, the customer may be forced to pay for an expensive unused circuit while waiting for the local end of the service.

Tariff inconsistencies between and within countries lead to artificial network topologies. Prices for identical services can vary by a factor of 10, depending on the location of the service. This forces companies to avoid connecting some offices, resulting in restricted competition.

Many PTTs are actively promoting variable charging on leased lines. Even though there is no current method of distinguishing between data and network-monitoring traffic, and these tariffs could hardly be cost-based, the PTTs feel this type of billing will help promote the introduction of new network services. The cost advantage of a private network is in consolidating the data traffic from multiple locations onto a fixed-price leased line. Variable-priced tariffing would make this exercise pointless and would, ultimately, force the use of the public data networks.

Certainly, some countries have invested massive amounts of capital in installing and upgrading their services. However, in a recent survey published by the European Association of Information Services, only one in three international calls was successful, and the networks were considered to be very unfriendly to the user. This type of reliability is completely unsuitable for a company whose revenues depend on the network 24 hours a day.

Although private networks can help reduce telecommunications costs, they are most beneficial when utilized as strategic weapons. Delivering information to customers directly can provide a strong competitive advantage. Many PTTs, however, prohibit this third-party traffic via private networks. This restriction of choice can severely handicap a multinational corporation that bases its service on speedy and reliable information delivery.

One argument expressed recently at the EEC meeting on information services in Luxembourg was that private networks utilize nonstandard methods of information delivery, which impede the flow of information. The PTTs argue that encouraging — or requiring — use of public nets with established standards will reduce the barriers to the free flow of information. Yet, private nets, supported by private corporate money, would not exist if they had no economic viability. Why should the PTTs, rather than the marketplace, determine this viability?

It's clear that corporations have little choice but to gain control of their communications futures, regardless of the countries in which they do business. A recent headline stated, "Corporate networks: Link up strategically or die," and this motto becomes obvious for companies that wish to compete in global markets.

Kearns is managing director of DunsNet in London.

ACCESS CHARGE OPPOSITION

MICHAEL F. FINNERAN

Don't bend the rules

Our industry has had a distressing reaction to the recent Federal Communications Commission proposal that the valued-added network (VAN) service providers' exemption from access charges be discontinued, effective January 1988.

As was widely reported in the press, canceling this exemption will bring about an increase in the price of dial-up access to those services on the order of $4 to $5 per hour. It should be noted here that I am not a regular user of these services and so have no ax to grind.

The industry seems to have lost sight of the reason for the massive restructuring just undergone with the Consent Decree and the Modified Final Judgment — that is, the ground rules laid down by divestiture. The whole idea was that the rules of competition would be codified, and then vendors and users would go about playing the game.

The rules were supposed to be clear: If you use the local public switched telephone network to get access to an inter-local access and transport area service, access charges apply. There seems to be no reason for a subsidy to be granted to one inter-LATA carrier and not another. If AT&T, MCI Communications Corp. and US Sprint Communications Co. pay access charges, then Telenet Communications Corp., Tymnet, McDonnell Douglas Network Systems Co. and other VANs should also pay, and at the same rate. Subsidies distort the market and, in this case, will tend to inhibit the use of better technologies in the network.

The local telephone companies have been trying to develop local data options for years. Because regulation subsidized the dumb way of doing things (via circuit-switched service), it was difficult or impossible to cost-justify more technically appropriate options. Also, the marketing skills of the local telephone companies, or the lack thereof, have no doubt been a contributing factor.

The options for low-speed data that have been proposed include central office local networks using data-over-voice loop multiplexers, intra-LATA packet-switching nets and, in the long run, using D-channel capacity for subscriber Integrated Services Digital Network access.

The major shortcoming of these options is that they have limited availability now. This argues only for a temporary hold on canceling the access charge exemption, not for continuing it indefinitely.

However, there has been almost no mention of these options, only predictions that we will never have home information services if we do not continue to support subsidies. This issue has even been put on the agenda of the congressional subcommittees dealing with telecommunications, and, if that bunch gets involved, you can kiss reason good-bye once and for all.

Certainly, such a severe increase in the cost of a service is going to have a direct impact on the demand for that service. In the short term, that's likely to mean that

Finneran is president of dBrn Associates, Inc. in Hewlett Neck, N.Y. He is also a telecommunications consultant, writer and lecturer on telecommunications issues.

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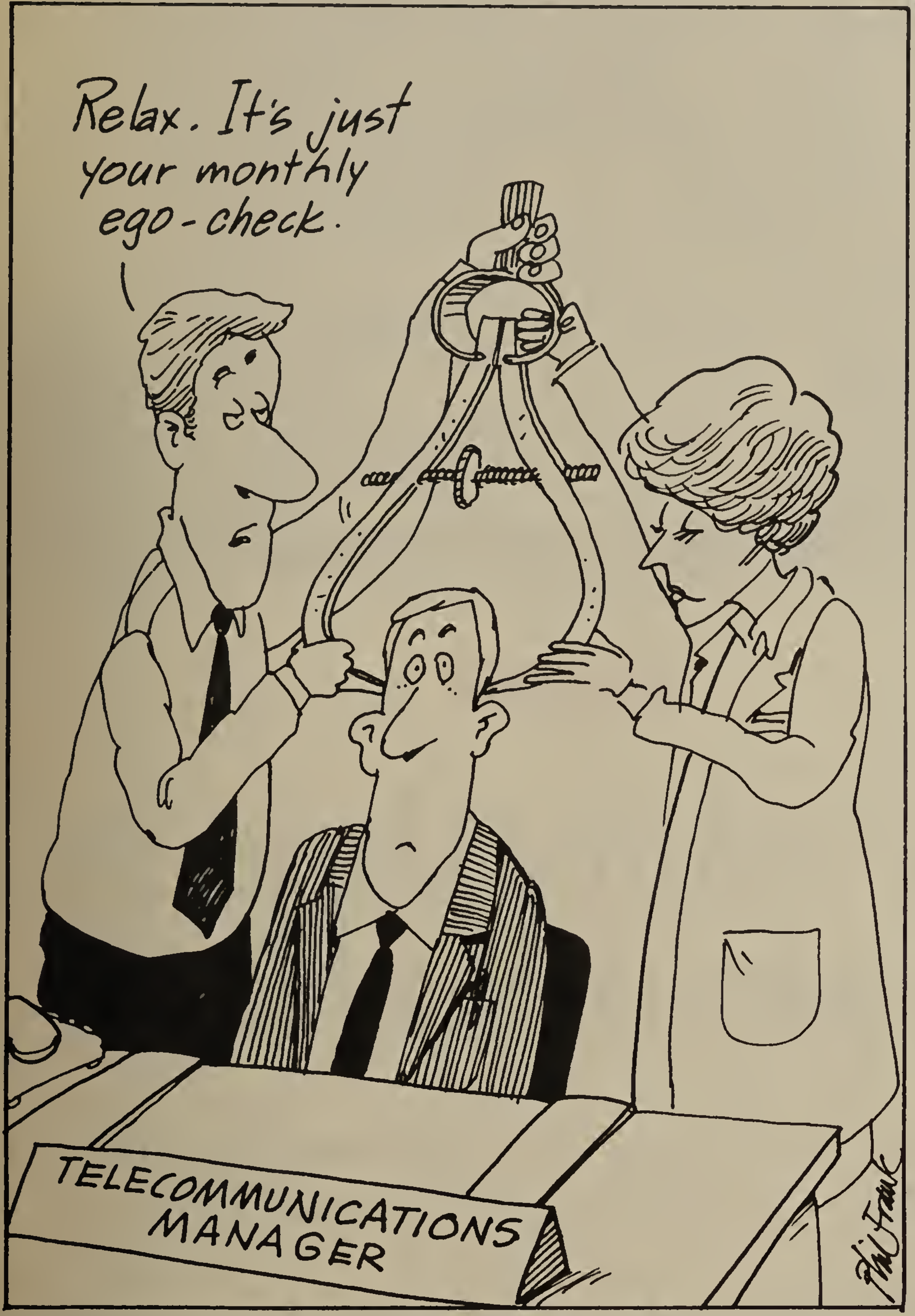
Contact Steve Moore, features editor, *Network World*, Box 9171, Framingham, Mass., 01701, or call (617) 879-0700, ext. 732.

▶TELETOONS — By Phil Frank


Relax. It's just your monthly ego-check.
TELECOMMUNICATIONS MANAGER
Phil Frank

certain applications for these network services will no longer be cost-justified. While this is unfortunate, it wasn't unforeseen; the exemption was granted on a temporary basis, and what the FCC giveth, the FCC can take away.

The direction of telecommunications in the U.S. is clearly toward competition, and subsidies are the antithesis of a competitive market. If we do not accept this, we'll be back where we started, and all we endured through the divestiture process will have been for naught.

The telecommunications industry should make the case for allowing alternative technologies to compete on their merits. We should press for implementation of technological alternatives, rather than for protection from competition.

One big assumption underlies my optimism that the FCC is following the correct strategy in requiring the VANs to collect access charges, and that is that the FCC will recognize the differences between technological alternatives and treat them appropriately.

For example, if it costs the local telephone company less to use a local packet-switching network to access the VAN network, then the access charge assessed on that packet access should be less.

Use of the local public switched telephone network to access the VANs should still be supported. But without the current subsidy, it should turn out to be a less cost-effective — and less utilized — option. That is basic to a competitive market.

Yet, instead of looking to technology to provide a solution, everyone is off hiring lawyers. Haven't we had enough from the lawyers already? From a technical standpoint, there's no difference between using the local public switched telephone network to get access to a VAN or to a voice network service, except for the modem. The important difference is that we have technological options for accessing data services. We don't have to use a subsidized, circuit-switched connection to provide cost-effective access to the VAN's network.

There is surely a place in this world for lawyers, but the industry's had enough of them for a while. Now let's see what the engineers can do.

NETWORK WORLD EDITORIAL

Juggling chainsaws

Perhaps the most oft-uttered phrase in the lexicon of communications management is "strategic planning."

Managers can hardly avoid hearing it. Pundits extol the virtues of strategic planning at conferences and seminars. Management literature harps on the necessity of it. And the trade press relates the bottom line-boosting exploits of those intrepid managers who put their noses to the strategic planning grindstone. The message is clear: In order to use communications effectively, managers must undertake strategic planning.

Frankly, managers might be better advised to juggle chainsaws. That would be easier than strategic planning these days. Given the topsy-turvy nature of the industry, it's amazing that managers can plan at all. And it's almost unfathomable that a handful of managers have put together such effective strategic plans that they've given their companies a real advantage over competitors.

Consider just a few of the plan-wrenching events that have transpired in recent weeks:

- Based on local carriers' proposed 1988 access charges, AT&T will cut switched long-distance prices once again — this time by $800 million. Such services as WATS, Megacom and Pro America look more attractive, especially in light of AT&T's intent to hike private-line costs by $128 million. Since divestiture, there has been little stability to the public network/private facilities equation. And the equation could change yet again owing to . . .
- The Federal Communications Commission's proposal to levy access charges against private network operators that route traffic into the local exchange. The proposal could cost users $170 million a year and is likely to draw a good deal of fire. The only thing at stake is how you configure your network, right?
- The FCC seems intent on moving ahead with its plan to assess similar access charges against value-added network (VAN) operators. At a recent meeting, the FCC acknowledged the clamor generated by the VAN access charge proposal. But the agency seems unwilling to retreat, and some users are tearing up their current network blueprints to reduce reliance on VANs.
- At the desktop, IBM raised as many questions as it answered in laying out delivery plans for its OS/2 operating system. Sure, the Personal System/2 offers vast improvements in speed and processing power, and the promised networking capabilities of OS/2 are tantalizing. But how do users fit these next-generation tools into their current plans?

IBM won't be delivering the advanced communications capabilities of OS/2 for a year — and then only if everything goes according to plan. Anyone who's been involved with a major software development project knows what the likelihood of that is.

What's more, IBM and OS/2 co-developer Microsoft Corp. have parted ways on a key facet of OS/2 — how the operating system will handle communications among applications in OS/2-based local networks. That could slow development of advanced network applications, and it raises a lot of questions for corporate network managers.

- Sources report that IBM is developing a radically different breed of communications processor, one that will handle a wide range of tasks. That gives you something else to pause and consider when drafting your acquisition plans.
- Ditto for IBM/Rolm Corp.'s introduction of the 9750 Business Communications System. Sure, it's got some advantages over the earlier Rolm private branch exchanges. But it's not really the next-generation switch many users were expecting. Can you truly afford to buy a transitional switch?
- Major vendors such as AT&T and Timeplex, Inc. outlined their net management architectures — their responses to IBM's NetView, as it were. Should you stay True Blue, or do you want to keep your net control options open? Can you afford to wait until the full capabilities of any of the new integrated net management systems become available?

Despite the questions these events raise, you, the communications manager, are expected to go forth and develop a strategic plan. And your plan isn't just supposed to get you by; it has to give your company a strategic advantage over competitors.

Good luck. After all that, you may find juggling chainsaws relaxing.

NETWORK WORLD

Features

December 21, 1987

Each year, *Network World*'s User Excellence Awards honor organizations that apply networking technologies in innovative ways. In this third annual competition, two finalists in dissimilar fields stood out from all the entries: Unified School District 259 of Wichita, Kan., and Midlantic Banks, Inc. of Edison, N.J. Each has developed an aggressive networking strategy that makes efficient use of available organizational resources to provide superior communications services to a community of users.

Join *Network World* in congratulating this year's award winner and runner-up in a special ceremony Jan. 26 at the Communications Networks '88 conference in Washington, D.C.

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1 In less than three years, Wichita's Unified School District 259 brought order out of communications chaos. This year's first place winner replaced 105 telephone and data systems with one microwave T-1 network, trimmed costs, dramatically improved communications and laid out a plan for potentially vast system expansion.

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29 Midlantic Banks, Inc. makes its money the new-fashioned way — by acquiring and merging with other financial institutions. Midlantic's Communications Services department's success in tying new branches to a rapidly growing T-1 trunk while pruning costs made the bank our User Excellence runner-up for 1987.

3rd Annual User Excellence Awards

WINNER

An education in communications

Wichita ties 110 school buildings together with T-1 microwave and twisted pair.

Continued from page 1

Wichita's Unified School District 259 is one of the largest education jurisdictions in the country. It comprises 70 elementary schools, 17 junior high schools, nine high schools and about a dozen administration and vocational education facilities spread out over a very flat 225 square miles.

As recently as 1985, the school district employed no fewer than 105 different telephone systems in its 110 buildings. Voice service alone was costing $900,000 annually; data transmission costs totaled $90,000 and were expected to rise to $135,000 by September 1987.

A new, strategically planned communications network would do more than just save transmission costs. Expansion, maintenance and improved services would be available to all users on the system and completely controlled by the school district. Voice mail would speed and improve personal communications. Chargeback plans would improve departmental budgeting. Subcarrier equipment would make the system easily and almost infinitely expandable.

Now, less than three years later, Unified 259 owns and operates its own districtwide communications network, supporting 46,000 students and 5,000 teachers, administrators and other workers. The sophisticated cable and microwave radio network provides digital T-1 service for voice, data and video switched over an installed base of 15 Mitel Corp. SX-2000 private branch exchanges, making it the largest networked Mitel PBX installation in the U.S.

The lesson plan

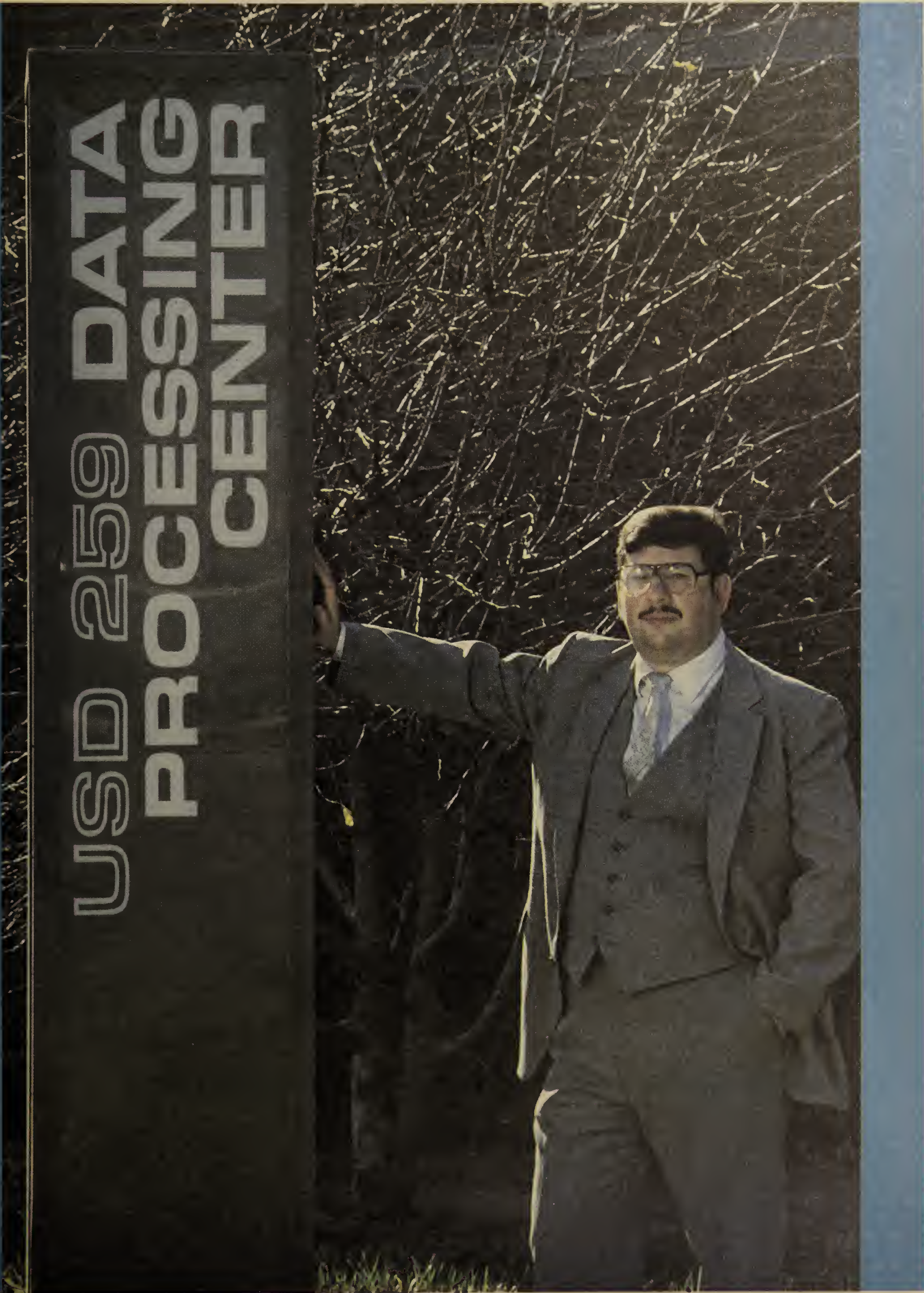
David Jones, supervisor of Unified 259's telecommunications operations, has been working diligently since 1985 to get Unified 259's new systems up and running. Work on the system began with the selection of Frank Greenberg, president of the Institute of Communications Services, a South St. Paul, Minn., consulting firm.

Greenberg, Jones and a school district committee drew up a detailed request for proposal to help them select a vendor capable of overseeing all phases of the project, including installation of cable, construction of microwave towers and placement of PBXs.

After reviewing bids, Jones, Greenberg and the committee members visited five different vendors, including AT&T,

Continued on page 27

King is a free-lance writer based in the Philadelphia area.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From page 24

GTE Corp., Rolm Corp., NEC Corp. and Mitel. The selection committee also visited user sites where these manufacturers' equipment was up and running.

To make the selection, Jones and members of the committee used a complex vendor-selection point system developed by Greenberg. "The working committee and our consultant either added or took off points for exceptions vendors made to our RFP," Jones explains. Ultimately, Unified 259 chose Mitel.

Mitel proposed to work with Telecom North, an interconnect company based in Little Chute, Wis., which acted as a subcontractor for all outside plant work, including laying cable, constructing microwave towers and procuring and installing microwave transmitters.

"Cost was not the deciding factor," says Jones, adding that "Mitel was not the lowest bidder, but it was the lowest responsive bidder meeting our specifications."

The selection process also provided the project's first major hurdle. According to published articles in *The Wichita Eagle-Beacon*, losing bidders raised questions about Greenberg's copyrighted point system and the way the bidding process was handled.

The school district hired a second consultant, Professional Telecommunications Service, Inc. of Kansas City, Mo., which reviewed Greenberg's work and determined that the bidding process was indeed fair and complete.

Under construction

The basic design of the system included installation of the 15 Mitel PBXs at strategic points around the district. Each PBX would be networked with T-1 microwave links. Twisted-pair cable would link outlying school buildings to the PBX hubs. Two PBXs were to be positioned as main switches: one in the district's Data Processing Center and the other in the School Service Center, which houses administrative and physical plant offices.

Microwave T-1 links were chosen because of the combination of widespread buildings and flat terrain. The committee had expected some local resistance to the construction and use of microwave towers, but none was forthcoming. Permits were filed for and approved, and construction was begun. However, difficulties and unexpected costs surfaced in the process of stringing cable between outlying buildings and the PBX hubs.

Jones says the working committee assumed it would have to obtain permits from Southwestern Bell Telephone Co. as well as Kansas Gas and Electric Co. to string cable on the two companies' poles. However, the committee didn't anticipate the six months of delay before it could get those permits.

In addition, the city required the school district to join an organization known as Kansas One Call, which Jones describes as a "diggers' hot line" service furnished by all entities with cable or pipe buried within the city limits. Members of One Call are required to have a dedicated telephone line to field calls from residents or contractors who want to perform work in the area of a member's installed cable.

While not a major expense, the costs associated with membership in Kansas One Call were unforeseen. During the summer months, United 259 was receiving an average of 25 calls per day at a cost of $1 per call, according to Jones.

In addition to needing city permits, Jones required permits from several railroad companies, because the district's cable plan involved stringing or burying cable in the vicinity of 25 railroad crossings. He says some railroad companies charged the district a nominal fee of $1 while others charged as much as $2,000 per crossing.

Other unforeseen charges were imposed by the local telephone company as well as Kansas Gas & Electric, all of which charged the district for "make-ready" work on their poles or conduits. Total charges for this work, which involved rearranging the "pecking order" of lines on poles, amounted to about $50,000, Jones says.

The district was also charged engineering fees by the companies. These fees, totaling several thousand dollars, were for "re-engineering" — inspecting and approving — the district's overall network plans.

The school system

Currently, Unified 259 is using its new system to switch all its voice traffic as well as its data traffic routed between the district's Data Processing Center and its 70 elementary schools.

Phase II of the project, scheduled for completion by mid-March 1988, will add the remainder of all data traffic to the network. Phase II will also eliminate the last 16 leased lines, which now connect the Data Processing Center to secondary schools and some administrative offices.

The network uses a total of 34 T-1 links. There are 15 microwave transmitters, one positioned at each of the hubs, and 19 dishes, all from Digital Microwave Corp.

Two 18-GHz transmitters and 13 23-GHz transmitters are used. Each of the two 18-GHz units has the bandwidth to handle as many as 28 T-1 links. Due to narrower bandwidths, each 23-GHz transmitter can handle as many as four T-1 circuits. The two 18-GHz transmitters handle traffic between the Data Processing Center and the School Service Center.

The remaining hub buildings are served by 23-GHz links. Some buildings use more than one microwave link. The Service Center, for example, has three microwave dishes carrying traffic in and out of the building.

The 70 miles of underground and overhead twisted-pair cable currently carry only voice traffic between the district's 110 buildings. The system supports close to 1,700 telephone extensions — 700 more than the earlier system — on a single network. This net provides 80 local, direct inward-dial lines and 100 outgoing lines spread out over the 15 different PBX hubs. It replaces about 400 switched lines.

All outgoing long-distance traffic is routed through a Mitel SX2000 acting as main switch at the school's Data Processing Center. Sixteen long-distance trunks equipped with outgoing WATS service are located at the Data Processing Center, along with all programmable PBX voice functions, such as voice mail and call detail recording. A second main switch, handling all incoming voice traffic, is located at the Service Center. Eighty direct inward-dial lines come into this PBX.

Jones explains that, during the initial year of operation, all long-distance costs are being absorbed by the Data Processing Center, which is building a history of each department's long-distance usage. A Xiox Corp. call detail recording system is being used with the main switch to monitor long-distance traffic. Users are identified by individual long-distance access code numbers. Once enough statistics are collected, departments will incorporate long-distance costs into their individual budgets.

In addition to furnishing this future bill-back information, locating the long-distance trunks at the Data Processing Center eliminates abuse of the district's telephone system. Jones says a program option on the Mitel switch in the Data Processing Center allows the system to limit long-distance calls by user access code numbers, putting through only long-distance calls made by authorized users.

Programmable features on the Mitel SX-2000s have also enabled the district to initiate voice-mail services, for which Jones foresees several applications, including automating attendance records. Jones currently has only half a dozen voice-mail users in a pilot program but says he expects this number to expand dramatically when the pilot is completed. He has received more than 1,000 requests for voice mailboxes.

Eventually, district plans call for making voice mailboxes available to parents on a 24-hour basis. These will allow parents to call in the night before if their children will not be attending classes the following day. The system will also off-load the work of school employees who now spend part of each morning answering such calls. Using the voice-mail system, employees will be able to collect all sick reports at one time and forward them to school officials via the same system.

School data

The district's IBM 4381 mainframe, Digital Equipment Corp. PDP-11/44 and 11/60 minicomputers all communicate through the new network, in addition to more than 300 microcomputers and 200 additional asynchronous and synchronous devices.

Data traffic is routed from remote users via Mitel Datasets built into or linked to Personal Computers and other devices through any of the PBXs located at network nodes to the switch at the Data Processing Center.

Asynchronous traffic to the IBM mainframe is then directed to 32 Mitel Datasets and on to a 32-port Micom Systems, Inc. Instanet switch, which translates data to the proper format for the central processor. Finally, traffic is routed over a Computer Communications, Inc. CC 8.5 front-end processor to the IBM mainframe. Each PBX on the network is equipped with modems, so that all programming and testing of remote equipment can be done from the Data Processing Center.

Previously, users with Personal Computers in the district's 70 elementary schools accessed the IBM mainframe's bank of enrollment, transportation, cafeteria and fixed asset data bases on a dial-up basis. Users loaded their Personal Computers with a communications link, which in turn would dial up a bank of 24 modems at the Data Processing Center to access a Micom switch with two integrated, 16-port protocol converters linked to the IBM mainframe.

"We were paying $45,000 a year for switched lines to handle asynchronous traffic to those 32 ports, so we decided to get rid of them first," Jones explains, adding that in doing so the district was able to cut recurring monthly costs and increase transmission speeds eightfold, from 1,200 baud to 9.6K baud. "This allowed the elementary schools faster access and faster turnaround on their work," he says.

During Phase Two of the project, the district will eliminate 16 leased lines now connecting the Data Processing Center to the district's secondary schools and administration buildings. This phase also calls for adding 64 ports of protocol conversion and providing a port-contention ratio of 3-to-1, which Jones says can be adjusted later if it proves inadequate. "When we're finished, we'll have all 110 locations — some with 70-plus devices — on the network," Jones says.

Additionally, the completed system will allow for direct access to the DEC PDP minicomputers via the Data Processing Center's Mitel switch. These minicomputers are used primarily for word processing and for running a program used by school guidance counselors to help students plan where to continue their education after high school. The PDP-11/44 and 11/60 are currently accessed by fewer than 12 Personal Computer users.

Jones says the school district is exploring the possibility of eventually eliminating the DEC minicomputers in favor of increasing the number of Personal Computers that will be linked via local- and metropolitan-area networks.

Currently, very few Personal Computers are linked with local nets. Jones says the district recently approved the purchase of an IBM System/36 minicomputer for

Continued on page 37

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RUNNER-UP

T-1: the medium of exchange

An aggressive investment in T-1 accounts for Midlantic Banks' compounding network interest.

BY KARYL SCOTT
Washington, D.C. Correspondent

A time-honored axiom says the only constant in life is change. Assistant Vice-President of Communications Services Frank Ferrara and his network management staff at Midlantic Banks, Inc., of Edison, N.J., understand this all too well. It's the ability of Ferrara and his staff to manage an ever-expanding T-1 voice and data network effectively that earned them the runner-up prize in this year's User Excellence Awards.

Ferrara and his staff have been called upon to merge the computer and communications operations of more than 340 bank branches into a unified communications system during the past six years. The department, reporting to Midlantic's Information Services Division, is responsible for delivering voice and data communications services to a constantly growing user base — some 9,000 voice users and 3,000 data users to date. That doesn't sound like an insurmountable task until it's placed against the backdrop of a constantly changing business environment.

Since its founding in 1971, Midlantic has acquired more than 30 banks with

Continued on page 31

3rd Annual User Excellence Awards

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From page 29

offices in such far-flung locations as Florida, North Carolina, Pennsylvania, New York, London, Hong Kong and its home state of New Jersey. Midlantic, with assets of $17.5 billion, is referred to in banking parlance as a "super regional bank" — an amalgam of 12 affiliate banks.

The recent loosening of interstate banking regulations was and continues to be the driving force behind Midlantic's expansion strategy. A liberalization of both state and federal banking rules has allowed banks to make acquisitions outside of their home state regions.

Midlantic's growth has been compounded by the company's desire to realize the efficiencies and economies of scale associated with large, centrally managed and integrated computing facilities.

The Information Services Division, responsible for all voice and data communications services, developed a single wide-area, high-capacity network, providing communications access between all branches and the bank's master computer center in West Orange, N.J.

By standardizing communications protocols — IBM's Systems Network Architecture — throughout the bank and by deploying T-1 technology for all voice and data traffic, Midlantic has been able to minimize communications costs and easily provide new and more computing services to end users in branch offices.

Midlantic is not among the largest communications users in the banking industry, nor does it embrace all the latest technological advances money can buy. However, it has efficiently and cost-effectively consolidated communications services in a rapidly changing business environment — something that would frazzle the nerves of most communications managers.

"It's not always the miraculous or extraordinary innovations that distinguish one user from the rest," Ferrara says. "Sometimes, it's recognizing the obvious and implementing some simple, fundamental changes that allow the company to save a great deal of money or increase the efficiency of various operations."

Ferrara's job during the past six years has included nine bank consolidations; the creation of Midline, the bank's interstate T-1 electronic tandem network; and the elimination of redundant computer and communications systems that resulted from mergers with various banks.

For example, Midlantic acquired Continental BanCorp. of Philadelphia in 1986 and is in the process of merging the two companies' computer and communications facilities — the result of which will be an anticipated $9 million annual savings for Midlantic.

"In May 1988, Continental will become a remote computing site connected by T-1 links to Midlantic's central processing center in West Orange," Ferrara says. "Continental will no longer need its own computer processing facilities once the consolidation is complete."

Continental's leased, on-site IBM 3090 hosts will be relinquished, and their leases will be terminated. Continental will share Midlantic's processing facilities, which will eliminate redundant site software licenses, some of which cost as much as $60,000 per site annually.

In addition, all of Continental's voice and data traffic will be merged into Midlantic's T-1 network.

Continental currently has separate communications links for various individual applications, according to Ferrara. "We'll eliminate those redundant links and run all their traffic over the Midlantic network," he says.

Also, multiple controllers at a single branch will be able to share a single T-1 link to access the bank's host computers. "We're using General DataComm, Inc. multiple access units in order to facilitate that sharing," Ferrara says, adding that, "It was a simple and easy thing to do, but we found that even the vendor hadn't anticipated this particular use for the equipment."

Rank-order banking

Midlantic, like most banks, has created an information systems hierarchy in which most branches rely on one or two central processors connected to full-screen teller terminals, according to James Murphy, Midlantic's network support manager.

The branch processors communicate with the IBM 3090 host computers at the bank's headquarters using the T-1 network, Murphy says. The system uses proprietary software, developed by Bunker Ramo Corp. Information Systems, which performs protocol conversion to allow the branch equipment to speak with the hosts using IBM SNA Synchronous Data Link Control.

Midlantic's processing power includes two IBM 3090 mainframes, Telex Computer Products, Inc. 3270 terminals for teleprocessing and Bunker Ramo controllers and terminals at bank branches — all of which function in the SNA environment.

The mainframes are linked with IBM's Multi-System Network Facility software, which controls joint network access and intermachine communications. Terminal users at branches can communicate across host-based applications using IBM's Cross Domain Application running IBM's VTAM.

In addition, Midlantic uses Tandem Computers, Inc. and Data General Corp. minicomputers for international wire transfers. These do not connect directly to the IBM hosts. In addition, Midlantic has a small number of Personal Computers — primarily IBM — deployed throughout its headquarters. The bank has no immediate plans to develop a networking strategy to link all of those Personal Computers or to bring them onto the Midline network.

Midlantic laid the foundation for today's networking strategy in 1981, when it committed itself to IBM's emerging SNA. "The driving force behind that decision was to make all our computer systems as compatible as possible," Ferrara says. "Whether we buy IBM gear or IBM look-alikes, the equipment must support SNA."

Private data highways

Data communications is transmitted over the private Midline T-1 backbone network between bank branches and two centralized computer processing sites in New Jersey and Pennsylvania.

"Midline was born in my den three years ago. We'd been looking at acquiring 56K bit/sec links at a time when no one at the bank was even thinking of sending 56K data," Ferrara says. "We were facing one-year lead times to order analog private lines from AT&T and the Bell [operating] companies. Each time we acquired a new bank, we needed to establish an immediate communications link with it. We couldn't do that after divestiture because of the order backlog," he explains.

"I planted a seed in the minds of the Information Services Division people, telling them that we could utilize transmission speeds higher than 56K bit/sec for check processing, remote printing and microfiche access. This idea, coupled with our desire to eliminate those one-year order times, made the T-1 backbone a very desirable concept" to upper-level management, Ferrara says.

Midline employs Timeplex, Inc. multiplexers located at Midlantic's primary computer operations center in West Orange. Local T-1 links are leased from New Jersey Bell, Bell of Pennsylvania and New York Telephone Co. Long-distance T-1 circuits are leased from AT&T.

Since its inception, Midlantic has expanded the Midline T-1 network and installed redundant links to prevent network failure. Circuits connecting any three branches are configured in a triangle, with each branch at a point of the triangle. This arrangement offers alternative routes through the branches, should any leg or node of the circuit triangle fail.

When new banks merge into the Midlantic family, new circuits are added. Midline today consists of 13 nodes and 16 T-1 circuits in New Jersey, New York and Pennsylvania. "We like to joke that we belong to the link-of-the-month club, because we add circuits so frequently," Ferrara says.

In addition to creating redundancy, Midlantic is in the process of formalizing plans for disaster recovery. Midlantic plans to use Comdisco, Inc. services for disaster recovery and backup for both batch and check processing.

This will require Midlantic to connect six of its remote processing sites in New Jersey and Pennsylvania with the Comdisco backup center in Carlstadt, N.J., using two dedicated T-1 links that will be added to the network. The plan is still under consideration by company officials.

"Before we had the T-1 network, we estimated that backup and disaster recovery would cost us $24,000 per month. Now that we have a T-1 network with redundant circuits, it won't cost nearly that much to link us with Comdisco," Ferrara says.

Voice pathways

Midlantic's voice network, called Midnet, uses the same T-1 backbone as well as a variety of AT&T private branch exchanges, ranging from the Dimension 400 to System 75 and System 85. Expanding at least as rapidly as the data network, the voice system faces many of the same hurdles, including eliminating redundancy and streamlining communications pathways.

For example, when Midlantic merged with Heritage Bank Corp. of Jamesburg, N.J., in 1985, the two banks shared 26 PBXs. That number has been pared down to 18 through integration of the two banks' voice networks. Midlantic terminated Heritage's long-term leases on eight PBXs and bought out its long-term service contracts, "resulting in a $95,000 monthly savings," according to Ferrara. Midlantic also eliminated the voice and data tie lines Heritage had installed between branch offices and its headquarters, replacing them with Midline T-1 transmission services.

Networking with vendors

Ferrara and his team of 28 network technicians have some simple but highly effective strategies for dealing with vendors — strategies that have served Midlantic well in times of network failure and contract negotiations.

For example, this past summer, one of New Jersey Bell's main digital fiber-optic trunks was cut by a backhoe digging below ground. As a result, 50,000 circuits were interrupted. A good portion of Midlantic's intralocal access and transport area circuits were put out of commission.

"Because of our relationship with New Jersey Bell and our knowledge of its digital facilities, we were able to suggest how to reroute our traffic," Ferrara says. "New Jersey Bell had our service restored within an hour, although most customers were without service for longer than that. If you don't know who to talk to or what to ask for, you're totally at the mercy of some unknown technician."

Ferrara is a firm believer in working with users groups to share common experiences in dealing with vendors. He says he attends a number of communications users group meetings and has witnessed firsthand how users can pressure a vendor to fix a product design problem or develop badly needed features for a product.

"There is power in numbers," Ferrara says. "When I have a problem with a vendor's product, the last thing [the vendor] wants me to do is make it public at a users group session. I use my participation in user forums to make the

Continued on page 37

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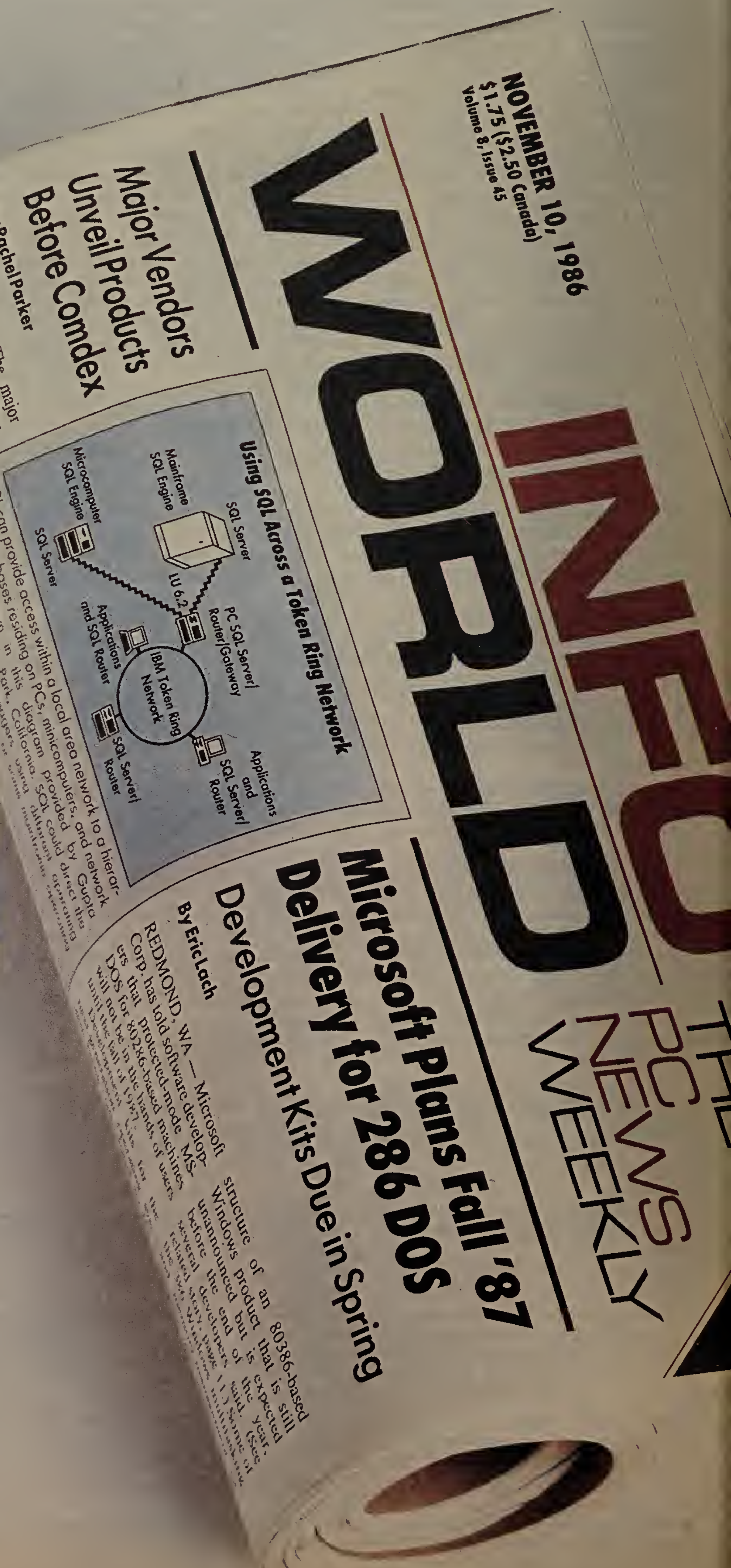

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Major Vendors Unveil Products Before Comdex

By Rachel Parker

LAS VEGAS — The major hardware and software vendors are using fall Comdex this year to generate interest in recently announced products rather than

Using SQL Across a Token Ring Network

SQL can provide access within a local area network to a hierarchy of databases residing on PCs, minicomputers, and network servers, as shown in this diagram provided by Gupta Technologies of Menlo Park, California.

Microsoft Plans Fall '87 Delivery for 286 DOS

Development Kits Due in Spring

By Eric Lach

REDMOND, WA — Microsoft Corp. has told software developers that protected-mode MS-DOS for 80286-based machines will not be in the hands of users

structure of an 80386-based Windows product that is still unannounced but is expected before the end of the

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(30) Engineering/R&D
(40) Personnel
(50) MIS/DP
(55) Information Center
(60) Sales/marketing
(70) Purchasing
(75) Operations
(80) Education/training
(90) Other (please specify)

4. HOW ARE YOU INVOLVED WITH EACH OF THE FOLLOWING TYPES OF MICROCOMPUTER EQUIPMENT? (PLEASE CHECK ALL THAT APPLY):

	X Micros	Y Software	Z Peripherals
Purchase or acquire	A.	A.	A.
Establish specs	B.	B.	B.
Recommend to others	C.	C.	C.
Use them	D.	D.	D.
Approve purchase	E.	E.	E.
Evaluate or select suppliers	F.	F.	F.
Train people to use	G.	G.	G.
Sell them	H.	H.	H.
Develop or manufacture	I.	I.	I.
Not involved	J.	J.	J.
Other (please specify)	K.	K.	K.

4a. FOR ABOUT HOW MANY PERSONAL COMPUTERS OR MICROCOMPUTER SYSTEMS DO YOU HAVE THE ABOVE INVOLVEMENT?
(PLEASE CIRCLE ONE ONLY):

(L) 1-3
(M) 4-6
(N) 7-9
(O) 10-24
(P) 25-49
(Q) 50-99
(R) 100-199
(S) 200-499
(T) 500+
(U) None of the above

5. HOW MANY PEOPLE WORK JUST AT YOUR LOCATION? (PLEASE CIRCLE ONE ONLY):

(A) Less than 10
(B) 10-24
(C) 25-99
(D) 100-499
(E) 500-999
(F) 1,000-2,499
(G) 2,500-4,999
(H) 5,000-9,999
(I) 10,000 or more

6. HOW MANY PEOPLE ARE EMPLOYED BY YOUR ENTIRE COMPANY? (PLEASE CIRCLE ONE ONLY):

(A) Less than 10
(B) 10-24
(C) 25-99
(D) 100-499
(E) 500-999
(F) 1,000-2,499
(G) 2,500-4,999
(H) 5,000-9,999
(I) 10,000 or more

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7. ARE THERE ANY MAINFRAME OR MINICOMPUTERS AT YOUR LOCATION?

☐ Yes ☐ No

8. DOES YOUR FIRM HAVE ANY OF THE FOLLOWING TYPES OF PERSONAL COMPUTERS OR MICROCOMPUTER SYSTEMS AT YOUR LOCATION?

☐ Yes (If yes, please give the **quantity** below for each model)
☐ No

IF YES, PLEASE GIVE THE QUANTITY FOR EACH MODEL.

Manufacturer's Name and Model	Currently Own	Plan to Purchase Within 12 Months
L. PC and PC/XT class		
M. PC/AT class		
N. PC's based on 80386 chip		
O. PS/2 Model 30		
P. PS/2 Models 50, 60		
Q. PS/2 Model 80		
R. Laptops		
S. Engineering workstations		
T. Macintosh		
U. Macintosh II		
V. All other (please specify)		

USE NUMBERS ONLY

8a. IF YES, PLEASE INDICATE THE TYPES OF OPERATING ENVIRONMENTS OR SYSTEMS UTILIZED AT YOUR LOCATION.
(PLEASE CIRCLE ALL THAT APPLY):

(A) MS-DOS or PC-DOS
(B) Unix or Xenix
(C) OS/2
(D) Other multi-user operating systems (please specify)
(E) Windows
(F) Other multi-tasking environments (DESQview, GEM)
(G) Macintosh
(H) Other (please specify)

9. THE PERSONAL COMPUTERS OR MICROCOMPUTER SYSTEMS AT YOUR LOCATION HAVE THE FOLLOWING COMMUNICATIONS CAPABILITIES:
(PLEASE CIRCLE ALL THAT APPLY):

(A) Communicate with micros via modem
(B) Local area network
(C) Communicate with internal company mainframe or mini
(D) Communicate with outside service bureau, database, or time-sharing service
(E) Voice/data
(F) None of the above

10. THE PERSONAL COMPUTERS OR MICROCOMPUTER SYSTEMS AT YOUR LOCATION ARE NORMALLY PURCHASED FROM:
(PLEASE CIRCLE ALL THAT APPLY):

(A) Retail computer store
(B) Manufacturer
(C) Distributor or wholesaler
(D) Mail order firm
(E) System house
(F) Other (please specify)
(G) None of the above

11. DO YOU HELP ACQUIRE, RECOMMEND, SPECIFY OR APPROVE ANY OF THE FOLLOWING:

☐ Yes (If yes, please circle all that apply): ☐ No

Software
(01) Spreadsheets
(02) Word processors
(03) Database management
(04) Accounting packages
(05) Statistics packages
(06) Communications
(07) Graphics/presentation pkg
(08) Project management
(09) Desktop publishing
(10) CAD/CAM/CAE
(11) Programming/languages
(12) Utilities
(39) Expert Systems

Computers
(13) Personal computers
(14) Multi-user micros
(15) Laptop micros
(16) Portable micros
(17) Engineering workstations
(18) Minicomputers
(19) Mainframe computers

Peripherals
(20) Dot matrix printer
(21) Letter quality printer
(22) Plotter
(23) Laser printer
(24) Local area network
(25) Modem
(26) Monochrome monitor
(27) Color monitor (Std.)
(28) HI-res color monitor
(29) Add-on board
(30) External hard disk
(31) Internal hard disk
(32) Optical disk
(33) Back-up systems

Outside Services
(34) On-line services
(35) Education/training
(36) Maintenance
(37) Custom applications
(38) Service bureau

11a. OVER THE COURSE OF ONE YEAR, DO YOU BUY, RECOMMEND, SPECIFY OR APPROVE MICROCOMPUTERS, SOFTWARE, PERIPHERALS, OR SERVICES WORTH:
(PLEASE CIRCLE ONE ONLY):

(A) Less than $10,000
(B) $10,000 to $24,999
(C) $25,000 to $49,999
(D) $50,000 to $99,999
(E) $100,000 to $199,999
(F) $200,000 to $399,999
(G) $400,000 or more
(H) None of the above

12. DO YOU PERSONALLY BUY, RECOMMEND, SPECIFY OR APPROVE MICROCOMPUTERS, SOFTWARE, AND/OR PERIPHERALS?

☐ Yes ☐ No

IF YES, PLEASE INDICATE FOR HOW MANY PERSONAL COMPUTERS OR MICRO SYSTEMS YOU HAVE THIS INVOLVEMENT.
(PLEASE CIRCLE ONE ONLY):

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T-1: the medium of exchange

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vendor give me the best service possible."

In addition, Midlantic holds monthly meetings with various representatives from the telephone companies. "It's something that was established after divestiture as a result of problems we were having with lost service orders, and it has continued to this day," Ferrara says. "Vendors are going to think twice about giving you bad service when they know they're going to have to face you every month."

Midlantic believes in using future expansion plans to leverage additional concessions from vendors today. As Ferrara says, "When I'm negotiating with salespeople, I tell them we have a 123-terminal ATM network, but we plan to increase that during the next year.

"With the promise of more business, I expect them to give me something more, perhaps an additional 5% off the price of what I'm buying today."

Ferrara's staff says he's a meticulous perfectionist who demands excellence from everyone who works for him. "Sometimes we shed a lot of sweat and tears when we're in the middle of a project, and Frank can be incredibly demanding. But when all is said and done, we're still friends, and the bank is better off as a result of Frank's tenacity," says one network manager on the Midlantic staff.

Ferrara insists on sharing Midlantic's success with his technicians, saying, "It's just a matter of knowing your business. Our department's charter and our primary accomplishment has been our ability to utilize the single ubiquitous network strategy fully and to take full advantage of the efficiencies of integration.

"Having an enthusiastic, committed staff allows us to go that additional mile. That's why we've been able to accomplish what we have."

An education in communications

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its vocational school. He says the System/36 will be linked to six personal computers via a local net. For security, all software will remain resident on the System/36.

A model network

In operation since September, Unified 259's new communications system is already considered something of a model for other large school districts. School systems in San Francisco, Dallas, Los Angeles, Atlanta and Memphis, Tenn., have expressed interest in emulating the Wichita system, according to the Institute of Communications Services' Greenberg. "To the best of my knowledge, no other school district has accomplished what has been accomplished in Wichita — total integration of all communications over one system with no limits to the expansion of that system," Greenberg says.

Jones says the school district has already seen many advantages of owning and operating its own in-house network. The district will pay about $650,000 less annually, compared with the cost of the switched lines formerly used to furnish voice service, he estimates.

Additional savings have accrued with the elimination of leased equipment and the ability to take advantage of WATS services, since all district buildings are now linked over a single network.

Moreover, the district expects to pay off its capital investment of $3.7 million in the new system in seven years and recoup most of that amount in less than a decade.

According to Greenberg, United 259 may eventually resell some of the current system's built-in 30% excess capacity, possibly to the city, which is considering installing a redundant voice microwave network for the Wichita police and fire departments.

"Joint venturing is the next logical step," Greenberg says, noting that United 259's PBX-based system could "easily serve the city's needs as well as the county's."

IBM mini to support voice

continued from page 1

System/36 and the IBM System/38. Analysts expect the new product to debut in early 1988.

Sources said IBM is hoping to improve its position in the mid-range market by providing Silverlake with the PBX option — an option other vendors would not offer. Redwood is targeted at small to medium-sized companies. It can also be used at smaller sites in a corporate network.

Analysts disagreed about when the Redwood option would be announced. Some expect the feature to be unveiled along with Silverlake. Others predicted it will not be announced until the middle of next year at the earliest. An IBM spokesman said the company does not comment on product speculation.

Eduardo Stecher, president of Communication Associates, Inc., a consulting firm in Natick, Mass., said customers initially will be able only to house the two systems in a single chassis. The device will not integrate voice and data functions.

Future releases will integrate voice and data, providing features such as switch support for terminals. Customers also may be able to support digitized voice signals as Systems Network Architecture data streams.

But a good deal of work would be involved in making the device support voice/data integration. Ian Angus, president of Angus Tele-Management Group, Inc., a Toronto consulting firm, noted that Redwood will have to be retooled because it currently does not support data transmission.

Software will also have to be written to support voice/data applications.

IBM may be willing to make the investment because the integrated device would support three corporate strategies. Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C. consulting firm, noted that IBM has been evolving SNA to support voice transmission.

Also, IBM has been trying to reduce production costs. Historically, the company's products used distinct components. But recently, IBM announced products that can use the same cabinets and expansion cards. For example, the IBM 9370 departmental system and the IBM 9750 PBX use many of the same components.

Finally, the mid-range historically has been the weakest link in IBM's product chain. Digital Equipment Corp. has successfully sold its mid-range systems to IBM customers.

IBM mid-range strategy

IBM has outlined a two-processor mid-range strategy to thwart DEC's progress. When the IBM 9370 was announced last fall, the product lacked communications software. During 1987, IBM announced products that enable the IBM 9370 to connect to an IBM Token-Ring Network, X.25 networks and Systems Network Architecture networks.

Next year, IBM will turn its attention to the second processor — Silverlake. By incorporating PBX functions into the system, IBM may offer features that DEC, which does not manufacture a PBX, cannot match.

Analysts were divided on the wisdom of the strategy. Stecher said mid-sized companies do not have large support staffs and would be interested in a system that supported both functions.

Dzubeck noted that, at most small companies, one person approves the computer purchase and a second oversees the voice system. Consequently, IBM may have difficulty getting the two to agree on a single system.

Ford picks AT&T for custom net

continued from page 1

Although AT&T and Ford declined to comment on the project, a source close to Ford confirmed that the carrier had been awarded the contract and that the "two parties are in the final stages of contract negotiation." The auto maker would not divulge the value of the contract.

Once the contract is signed, AT&T will have to submit project information under its Tariff 12 to the Federal Communications Commission. This tariff enables AT&T to draw from its pool of switched and dedicated transmission services to build custom networks.

An FCC source said AT&T is expected to file for the Ford network in the near future.

The planned integrated voice/data network, dubbed Fordnet 2, will tie numerous Ford locations to its headquarters here. The network will also likely include a network operations center similar to the one the state of Wisconsin uses to monitor its statewide net.

The new network will at least partially replace the AT&T Enhanced Private-Switched Communications Service (EPSCS) network the company currently uses to carry the bulk of its long-distance voice traffic.

EPSCS was designed to provide savings for large users by combining their traffic over switches dedicated to the service but shared by all service users. Ford's EPSCS locations access the EPSCS network through four or five switches.

The new Ford T-1 network will be used to integrate voice and data traffic. This traffic will terminate on the Digital Access and Cross-Connect System at Michigan Bell's Fairborn central office in Dearborn.

Data will be sent to one of Ford's two data centers here, and voice traffic will be routed to the appropriate offices serving Centrex. Ford uses Centrex to support more than 12 closely clustered locations in Southeastern Michigan. The company signed a long-term agreement with Michigan Bell for digital Centrex services late last year. Daryle Brown, a market administrator for the Bell operating company, said Ford is Michigan Bell's largest Centrex user.

AT&T's plans to construct Fordnet 2 represent an emerging trend to provide its largest users with turnkey networks. AT&T first proposed a custom network to the Department of Defense in 1985.

More recently, the carrier signed a network contract to provide General Electric Co. with a hybrid AT&T Software-Defined Network Service/Electronic Tandem Network in March. Industry analysts estimated the value of the contract to be roughly $300 million.

Under the contract, AT&T is to provide GE with an integrated voice/data net that would serve 700 company sites and use a new proprietary switching technology called Digital Tandem Switching System ("AT&T filing reveals guarded GE network," *NW*, May 4).

In mid-September, AT&T introduced Virtual Telecommunications Network Service. The service covers all AT&T offerings brought together to build custom networks. E.I. Du Pont de Nemours & Co. signed a three-year, multimillion dollar contract for the offering on Aug. 7.

Lee Selwyn, president of Economics & Technology, Inc., a Boston-based communications research and consulting firm, said contracting for custom networks ties users' hands. "Contracting for one of these custom networks means the customer is forced to take virtually all services from AT&T," Selwyn said.

Dear Santa: Bring network gifts

continued from page 1

(OSI) model to vendors.

"Some help from the North Pole would get the ISO protocols in place faster," Nichols said.

John Mott, director of telecommunications at the Chicago Board of Trade, directed his wishes southward, toward Washington, D.C.

"I would like complete deregulation of the communications industry," Mott said. "I wish we could open up competition and allow more options for purchasing equipment and services."

On the other hand, Bill Farrell, New England manager of switch procurement for the U.S. General Services Administration, said he sometimes wishes for the reunification of the Bell System. "But those days are gone," he said. "So I think I'll just ask for some improvements in network management equipment."

An end to local loop problems in the Wall Street area is Ken Germann's fondest holiday wish.

"I would like complete deregulation of the communications industry," said John Mott. "I wish we could open up competition and allow more options for purchasing equipment and services."

"We have the oldest copper in Manhattan," said Germann, communications manager for Brown Brothers Harriman & Co., an investment banking and brokerage house. "Between that and all the construction in the area, we are always losing service."

Don Gaffney, vice-president of Fundamental Information Systems, Inc. and president of the Communications Managers Association, is hoping for something that may be hard for even Santa to deliver. "I'd like a wall outlet that would allow me to instantly deliver a private line to every one of our traders' desks," said Gaffney, whose company oversees communications and information systems for Williams Street Brokers in New York.

Franker and more forthcoming vendors would make Stephen Carnilla happier in 1988.

"I'm wishing for account executives and salespeople who are more sincere and are not just interested in the short term," said Carnilla, director of University Services at Loyola University in New Orleans.

Carnilla said he is frustrated by vendors that try to land sales by overtouting their products. He said he appreciates vendor representatives who are forthright about the strengths and weaknesses of their products. "It's difficult enough to select the best network equipment, even when the vendors are upfront about their products," Carnilla said.

The ideal presents, of course, are the extravagant ones that are too pricey to justify under normal circumstances.

Local-area network testing equipment falls into that category for Tony Holland, manager of communications and technical services at SRI International in Menlo Park, Calif.

"It's a pretty high-price item — $10,000 to $15,000," Holland said. "That's hard to justify for a medium-sized LAN, but it sure would be helpful."

Jerald Marcone, assistant vice-president of telecommunications at Crum & Forster Corp. in Morristown, N.J., wishes he could buy a private branch exchange at the per-line prices he sees quoted in the press and in vendor literature.

"I'd also like to have an accurate projection of next year's data network traffic," Marcone said.

A bigger budget to hire more staff would be a nice holiday gift for Don Pero, manager of corporate telephone systems at Rochester Gas & Electric Corp. Pero would also be very happy to wake up on Christmas morning and find "an already installed voice-messaging system."

On the other hand, Bill Farrell, manager of switch procurement for the U.S. GSA in New England, said he sometimes wishes for the reunification of the Bell System. "But those days are gone."

If there are none of those left, some help in marketing the excess capacity on the utility's fiber-optic network would be be a fitting holiday gift, Pero said.

A surefire way to get the ear of upper management would be the perfect gift, according to Carleta Vineys, manager of telecommunications for the San Francisco News Agency.

"Insight into the best way to convey our needs and goals to upper management would be a wonderful gift," said Vineys, whose organization provides voice and data communications services for the *San Francisco Chronicle* and the *San Francisco Examiner* newspapers.

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CALENDAR

Jan. 4-6, Washington, D.C. — Telecommunications Traffic Engineering. Contact: George Washington University, School of Engineering and Applied Sciences, Washington, D.C. 20052.

Jan. 4-8, Chicago — AT&T Networking Products Overview. Contact: AT&T Corporate Education and Training, P.O. Box 1000, Hopewell, N.J. 08525.

Jan. 6-8, Baltimore — Hands-On SNA. Also Jan. 13-15, Sacramento, Calif. Contact: Datacomm Group, American Institute, Inc., 55 Main St., Madison, N.J. 07940.

Jan. 11-15, Irvine, Calif. — ISDN Week. Contact: Teledimensions Systems Corp., 21552 Shillingsburg Ave., San Jose, Calif. 95120.

Jan. 12-13, Washington, D.C. — Local-Area Networks. Contact: Data Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Jan. 14-15, Seattle — Networking the IBM Personal Computer, XT and Compatibles. Contact: Data Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Jan. 18-21, Tampa, Fla. — 16th Annual BICSI Conference. Telecommunications Distribution Design in Buildings. Contact: BICSI, University of South Florida, LLL 012, Tampa, Fla. 33620.

Jan. 19-20, Chicago — Understanding ISDN. Contact: Telecommunications Research Associates, P.O. Box 1200, Newark, Ill. 60541.

Jan. 20, New York — Corporate PC Data Communications and Connectivity. Contact: Access Data Products, Inc., 559 Gramatan Ave., Mount Vernon, N.Y. 10552.

Jan. 25, Washington, D.C. — Communication Networks Conference and Exposition In-Depth Seminar Curriculum. Contact: Communication Networks '88 In-Depth Tutorial Program, P.O. Box 9171, Framingham, Mass. 01701.

Jan. 26-27, Somerset, N.J. — Data Comm I, Data Comm II. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Jan. 28-30, Fort Lauderdale, Fla. — Winter Convention of the National Association of Telecommunications Dealers. Contact: Frontier Computer, 4025 Bronze Way, Dallas, Texas 75237.

Feb. 3-5, Milwaukee — Working with Personal Computer Local-Area Networks. Contact: Center for Continuing Engineering Education, University of Wisconsin-Milwaukee, 929 N. Sixth St., Milwaukee, Wis. 53203.

▶ *PRODUCT COMPARISON*

The light side of multiplexing

BY JOHN J. HUNTER
Contributing Editor

While current prices for fiber-optic cable and connectors aren't competitive with copper and coaxial cable, fiber-optic systems are still a good deal.

Fiber-optic materials can carry more data than any other terrestrial facility. They also take up less space and are easier to pull than coaxial cable, and they have much lower bit error ratios than leased or public dial-up telephone lines.

A fiber-optic multiplexer makes optimum use of the medium's bandwidth and spreads network costs over a greater number of users. Currently, there are dozens of such products on the market, but two stand out in overall terminal-handling capacity: the Canoga Perkins Model 3272 and the Optelecom, Inc. Model 5210-16.

Both operate over multimode, graded-index fiber cable, and both accept asynchronous and synchronous data. The Canoga Perkins product handles up to 144 channels, while the Model 5210-16 accommodates 160. Both allow data to be transmitted up to 7 km without repeaters.

Channel-handling capacity varies with input channel speeds. The Canoga Perkins Model 3272's 144-channel capacity is calculated with all inputs at 9.6K bit/sec asynchronous. Its top asynchronous data rate is 100K bit/sec, and the maximum synchronous rate is 76.8K bit/sec. The maximum data transmission rate over a fiber link is 17.28M bit/sec.

The 160-channel capacity of the Optelecom Model 5210-16 is calculated by assuming that all inputs are pumping in 4.8K bit/sec asynchronous. The unit has a much higher synchronous input data rate than the Model 3272 — 153K bit/sec — but its maximum data transmission rate is considerably lower — 768K bit/sec. Figures for the unit's top asynchronous input data rate were not available at press time.

When it comes to handling synchronous data, however, there's a rub with these units. Model 3272 users must furnish an external clock source. That halves the channel-carrying capacity of the unit because a separate channel is needed to carry the clocking.

The Model 5210-16 also accepts external clocking but with the same ratio of channel-handling reduction. This model, however, can furnish clocking internally, in which case it accommodates up to 128 synchronous channels.

Stand-alone vs. rack-mount

The Model 3272 is offered in stand-alone or rack-mountable versions. The stand-alone unit can be configured with 18, 36, 72, 108 or 144 channels, although an expansion module is required for more than 72 channels. Data inputs terminate at 50-pin Telco connectors, with each connector handling six RS-232-C channels. This arrangement allows for minimum cabling while attaining maximum flexibility in wire-closet punch-block installations.

The Model 5210-16 base unit accommodates up to 80 channels; beyond that, an expansion module is needed. Additional channels can be added in groups of 10, up to the system's limit of 160.

Optelecom's data interface scheme differs. While the 5210-16 works with RS-232-C interfaces, it has nine-pin (DB9) connectors on the back of the multiplexer. Therefore, terminals must use a cable with a DB9 connector on one end and an RS-232-C connector on the other. The DB9 connector shouldn't run up overall cost too much. Some catalogs charge only $1 or $2 extra for an RS-232-C cable with a DB9 connection.

Two fiber-optic multiplexers compared

	Vendor/Product	
	Canoga Perkins Chatsworth, Calif./ Model 3272	Optelecom, Inc. Gaithersburg, Va./ Model 5210-16
Input channels supported	144	160
Maximum transmission distance	7 km to 23 km	4 km to 7 km
Price	$3K for 72 channels $5.3K for 144 channels	$4.4K for 80 channels $8.2K for 160 channels

SOURCE: TMS CORP., DEVON, PA.

Both units use time-division multiplexer (TDM) techniques, assigning input data to time slots in the transmission frame and transmitting it to an identical unit at the receiving location.

A big difference between a conventional TDM and a fiber-optic unit is that data isn't modulated onto the carrier lines through a modem. Instead, it's transmitted via a lightwave generated by the multiplexer. Most fiber-optic multiplexers use a laser diode or LED as the light generator and a positive-intrinsic negative diode or avalanche photo diode (APD) as a light detector at the receiver.

Laser diodes and LEDs emit a range of frequencies but are low-power units radiating a few milliwatts. Like copper wire, fiber-optic cable causes signal-power degradation, depending on the loss characteristics of the cable, signal dispersion during transfer and attenuation losses.

Distance limits

Data transmission distance depends on the power output of the transmitter, the overall loss characteristics of the cable and its connectors and the sensitivity of the receiver. The Model 3272's LED transmission power is -19 dBm, -17 dBm, -13dBm and -12dBm into 50/125, 62.5/125, 85/125 and 100/140 multimode, graded-index fiber cable, respectively.

The 3272's standard receiver, or detector, is a positive-intrinsic negative diode with a sensitivity of -34 dBm and a loss budget of 13dB, 15dB, 19dB and 20dB, respectively, with the aforementioned fiber-optic cable. The maximum transmission distance using 50/125 cable is 3½ km before repeaters are required.

For greater distances, four versions of the Model 3272 are offered. In addition to the standard model, a second version uses a high-radiant LED and an APD detector with a sensitivity of -44dBm. The loss budget of each model into the aforementioned fiber-optic cable is 25dB, 27dB, 31dB and 32dB, respectively, and the unit will transmit data up to 6 km with 50/125 cable.

The third unit uses an even higher radiant LED and an APD. This model has a 7-km rating without repeaters. The fourth version uses a laser diode and APD, and it can transmit data at 11 km without repeaters. This final version of the Model 3272 operates on a single-mode cable. Its maximum transmission distance without repeaters is 20 km to 23 km. All of these ratings are attained using standard 50/125 fiber.

Distances quoted by both vendors are approximations and will vary with the quality of the cable and the signal loss caused by connectors. For better grades of cable and connectors, the distances could be further; for poorer media, they could be less.

The Model 5210-16 also uses an LED transmitter and positive-intrinsic negative diode detector, but its transmitter is more powerful than the 3272's, with a -11dBm rating into 50/125 fiber and -17dBm into 100/140. The vendor would not furnish figures for other cable types.

The positive-intrinsic negative diode receiver, however, is a shade more sensitive with a -35dBm rating, and its loss budget is better at 16dB and 22dB for 50/125 and 100/140 cable, respectively. (With loss budgets, the higher the number, the further the data can be transmitted.)

According to Optelecom, the 5210-16 can transmit data up to 4 km on 50/125 cable without repeaters. For longer distances, it can be ordered with a high-radiant LED, which allows transmission on 50/125 cable up to 7 km without repeaters.

People accustomed to the software control found with most TDMs and statistical multiplexers may be unhappy with these units, as both use DIP switches to establish configurations. DIP switches are acceptable if configurations are not changed often, but they're inconvenient when frequent channel reassignments are required.

The diagnostics offered by both multiplexers are simple local and remote loop-backing. Since fiber-optic links operate without modems and are not subject to the same maladies as leased or dial-up telephone lines, elaborate diagnostics are unnecessary.

Users speak out

Tom Deutsch, operations manager at Dow Jones & Co. Inc. in New York, says Dow Jones has about 100 Optelecom multiplexers installed, and the products have worked nearly perfectly. "We haven't had an entire box failure in three years," he says. "The worst that's happened is a channel failure. Other than that, they've been solid performers."

Ed Robinson, president of Electronic Ventures, Inc., a Wakefield, Mass., consulting firm, has been equally happy with the Model 3272. He's been installing Canoga Perkins multiplexers for about seven years and says he's had "only minor problems." Robinson backs the vendor's claim that all channels can run at 9.6K bit/sec. "[A client] has been running all 144 channels at 9.6K bit/sec for six months, and nobody's complaining about poor service," he says.

Optelecom's edge

The Optelecom unit has a slight performance edge over the standard Canoga Perkins Model 3272, due to its more powerful LED, sensitive positive-intrinsic negative diode and better loss budget.

However, Optelecom has nothing to match the laser diode and APD of the 11-km version of the Canoga-Perkins Model 3272, nor does the company have a single-mode product.

Both are suited for point-to-point applications only, so users requiring a multidrop or star configuration should look elsewhere. Also, neither product supports echoplexing, so equipment or applications requiring it can't be used. Finally, neither offers redundant power supplies or control logic.

Either product would be a good choice for users looking for a solid multiplexer that can be easily expanded.◻

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

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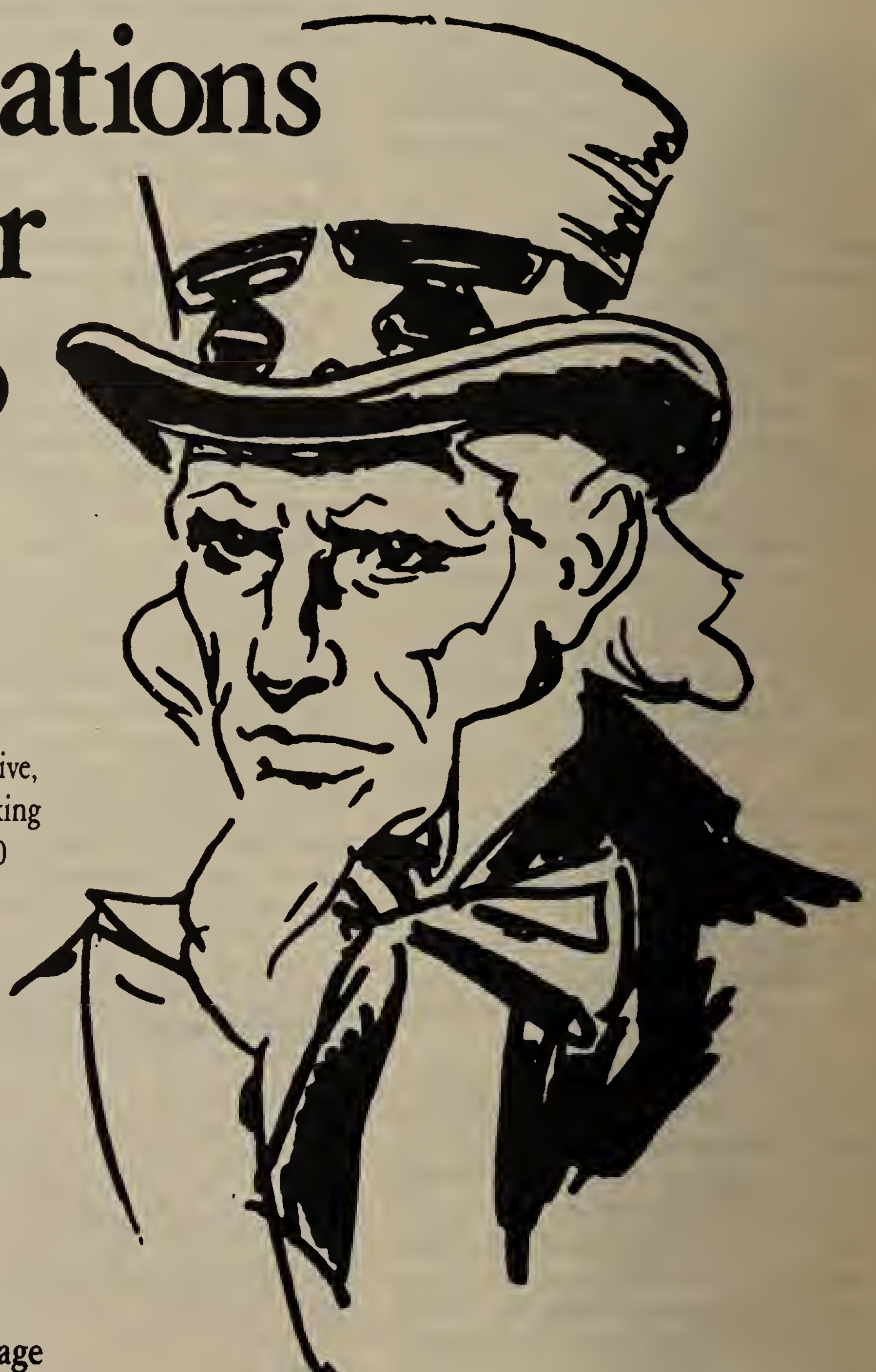

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